STATISTICS

OF

THE AMERICAN AND FOREIGN IRON TRADES

IN 1880.

ANNUAL REPORT OF THE SECRETARY

OF THE

AMERICAN

IRON AND STEEL ASSOCIATION,

CONTAINING

STATISTICS OF THE AMERICAN IRON TRADE TO JANUARY 1, 1881, AND A REVIEW OF THE PRESENT CONDITION OF THE IRON INDUSTRY IN FOREIGN COUNTRIES.

JAMES M. SWANK,

SECRETARY.

PRESENTED TO THE MEMBERS, JULY 30, 1881.

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PRELIMINARY STATEMENT.

HON. DANIEL J. MORRELL,

President of The American Iron and Steel Association.

DEAR SIR:—I have the honor to submit to you herewith, and to the members of the Association, my ninth annual report, containing complete statistics of the production and prices of American iron and steel products in 1880 and preceding years; also, coal, immigration, railway, commercial, and other domestic statistics of interest and value to American iron and steel manufacturers; also, a review of the British iron and steel industries in 1880, and of the iron, steel, and coal industries of other foreign countries in recent years.

The preparation of this report has been unexpectedly delayed in consequence of serious interruptions to the routine work of this office, caused by complications in connection with the administration of the revenue laws which affect the duties on iron and steel. During the past few months the time of every employé of this office has been largely occupied in giving attention to revenue cases. Delay in the preparation of this report was unavoidable under the circumstances. This result is especially to be regretted in view of the fact that extraordinary efforts were made, before the interruption referred to, to secure the statistics which would enable me to issue an early report—efforts which were so far successful that the production of pig iron in 1880 in every pig-iron producing State and Territory was obtained in February last and printed in *The Bulletin*.

During the Presidential and Congressional campaign of last year the Cobden Club of England threw off all disguise and sought directly to influence the free expression of the popular will in many States by circulating large quantities of English-printed books and pamphlets which outrageously misrepresented the effects of our Protective policy and falsely alleged that this country would be more prosperous under the British policy of Free Trade. This Association promptly undertook the work of counteracting this movement of the Cobden Club, and a series of Protective tariff tracts, embracing over half a million copies, was printed and circulated in the wake of the Free Trade publications. The result need not be dwelt upon, except to say that it completely vindicated the policy of maintaining in this country a strong organization that should be capable of meeting and defeating any similar assault upon American industries. The safety of the people from foreign dictation in their domestic affairs should be for it in such an emergency the supreme law. In this spirit, and in no other spirit, did this Association aid in rebuking the Cobden Club for its hostile attempt to control our elections for the benefit of English manufacturers.

This leads me to remark further that there exists to-day in this country a wide-spread and very gratifying demand for Protective tariff literature. The

old standards of authority on Protection are either out of print or are not wholly suited to the present aspects of the subject, and new and fresh treatises are urgently needed, some of which should be elementary in their character. It is greatly to be regretted that there is an actual scarcity of really valuable books that are adapted to the wants of that large class of our fellow-citizens who have not heretofore given much attention to the merits of the Protective policy, but who wish now to become familiar with them. This class, which includes the students at our colleges and universities and the young farmers of the Great West, demands books that shall deal not only with principles but also with results. What has Protection done for this country, and what does it propose to do, are questions that it wants to see answered. It is a shame that the country is almost without a literature that would enable the students at our higher schools of learning to meet and refute the sophistries and the flagrant falsehoods of their Free Trade teachers of alleged political economy. It is a shame that, for want of suitable books of reference, even one Western farmer should be deluded into the belief that the policy which proposes to establish a woolen factory, or an iron rolling mill, or a manufactory of any kind near his farm is his enemy and not his friend. The work of friendly newspapers is not in a form suitable for preservation, and hence books of reference of reasonable size and cost are necessary. This Association proposes to do what it can in the immediate future to meet the want mentioned, but it can not do all that should be done, and it is hoped that other agencies will co-operate, each in its own way, in a work of such vast importance to the future welfare of all American industries.

The time appears to have arrived when a general revision of the tariff has become necessary. Twenty years have elapsed since the Morrill tariff became a law, and it has since been frequently revised—the last important revision having been made eleven years ago. But the tariff as it exists to-day, while correct in principle and in the main effectual in providing revenue for the Government and Protection for home industry, is too complex in construction and too indefinite in many of its provisions. It has afforded opportunity for abuses and erroneous interpretations which have been productive of serious consequences—the Treasury losing the revenue to which it was entitled and many industries losing the Protection which it was intended they should have. Controversies between the Treasury Department and manufacturers concerning the construction to be placed on certain clauses of the tariff are not desirable nor profitable, nor is a determination in the courts of questions at issue to be desired. Indeed in many cases no way exists by which manufacturers can obtain relief in the courts for injuries to their business inflicted by erroneous Treasury decisions. Many branches of the iron and steel industries of the country have seriously suffered from an indefiniteness of tariff provisions. Some of the objectionable interpretations that have been given to certain provisions which relate to iron and steel could not have been guarded against when the provisions themselves were adopted, because processes of manufacture and commercial designations now exist which were not then known. For these reasons, as well as to meet a general demand that the tariff shall be simplified and freed from needless impediment to its general acceptance as a permanent system for the creation of both revenue and Protection, a revision seems neces-

sary. This Association is, I believe, unanimously of the opinion that, if a revision is undertaken, it should primarily be confided to a commission appointed by the President and confirmed by the Senate.

I respectfully call attention to the present form of *The Bulletin*. I have long felt that it is too small to answer the purposes of a newspaper, and that the frequency of its publication, (once a week,) and the expectation that it shall contain some portion at least of the current news, prevent it from partaking of the character of a magazine. And yet a magazine is what it should be. The American iron and steel industries do not lack for newspapers, to report the changes in the markets and to note the other changes and improvements that affect or interest the producers of iron and steel, but no American magazine exists that will from month to month preserve in convenient and attractive form such technical, statistical, historical, political, and other information as would be of permanent value to these producers and to Members of Congress, journalists, political economists, and others. Such a magazine would be read and preserved, and if bound from year to year would form a treasury of valuable information that could nowhere else be found. *The Bulletin* in its present form is neither a magazine nor a newspaper. It has never been what I would have liked to make it, and yet I can not see how, within its circumscribed limits, and under its restricted conditions, it could have been made much different from what it has been. If it is to be continued as a weekly publication, it should be enlarged; if deemed advisable to change it to a magazine, I recommend that it be issued monthly, in size and appearance corresponding to the *Bulletin* of the National Association of Wool Manufacturers, which has for many years been the best trade magazine in this country. The annual report of the Secretary could always appear in a style uniform with the magazine, so as to be bound with it from year to year, or it might, to lessen expense, form a single issue of the magazine.

I may be permitted to remark that the statistical contents of this report which relate to our own country are of exceptional value. Many of the tables of production, imports, exports, etc., are much fuller than in preceding reports. Another feature that may be mentioned is that most of the tables cover the decade between 1870 and 1880, which forms one of the most eventful eras in our history, especially in our iron history. In this report the record of our achievements in the production of iron and steel in that decade is closed. We enter upon a new decade under the most favorable auspices. I firmly believe that before its close the United States will become in all respects the first iron and steel producing country, and the first coal producing country, in the world.

I am under many and great obligations to the Hon. Joseph Nimmo, Jr., Chief of the Bureau of Statistics at Washington, for valuable statistical information embodied in this report.

Mr. George W. Cope continues to render valuable service to the Association as Assistant Secretary. I take pleasure in adding that Mr. William M. Sweet has within the past year been advanced from a subordinate clerkship to a position of responsibility in this office, which he fills with satisfaction.

Very Respectfully,

JAMES M. SWANK,

PHILADELPHIA, July 30, 1881. *Secretary.*

STATISTICS OF THE AMERICAN IRON TRADE IN 1880.

BRIEF REVIEW OF THE DOMESTIC IRON TRADE IN 1880 AND DURING THE FIRST HALF OF 1881.

THE condition of the American iron trade since the publication of our last annual report in May, 1880, can be briefly stated. It has been in the main healthy and satisfactory. The demand for all iron and steel products has been even greater than during the year of the "boom," which may in general terms be described as having extended from May, 1879, to May, 1880. This demand has been more fully met by home production than during the phenomenal period referred to—a result in part of our increased productive capacity and in part of the fall in home prices which arrested the tendency to foreign importations. The restoration of the home market to the home producer was facilitated by a singular delusion which for many months after the end of the "boom" affected the judgment of foreign iron producers. They could not realize that the bubble had bursted—that an end had come to excited orders from this side for their iron products at any price which they would be kind enough to name, and so in their infatuation they kept on making pig iron and some other products as if nothing had happened on this side, expecting to continue selling them to us at prices approximating those which they had but recently received. This maintenance on the other side of comparatively high prices during the summer and autumn of 1880 assisted greatly to place the market on this side on a healthy basis, which has since been fairly maintained. Had British ironmasters realized a year and more ago as clearly as we did that the excitement and the high prices in this country had then come to an end, and could not be revived, their prices would have broken so badly that complete demoralization and wide-spread disaster would have ensued on this side. We have since had to contend with heavy importations of foreign iron, but this evil has been far less than would have been the panic in prices which Great Britain would have precipitated upon us last summer if her ironmasters had comprehended the full significance of the American situation at that time.

It will be remembered that prices broke in this country in February of last year, and that they declined rapidly until May and June, when they became steady. It is an interesting fact that in the period which has since elapsed the prices which then prevailed have been well maintained and have been remarkably uniform. The average price of No. 1 anthracite foundry pig iron in May of last year was $25, and in June of this year it was $24, the fluctuations in the mean time being between $23 and $26. The average price of iron rails in May of last year was $50, and in June following it was $46.25; in June of this year it was $46.50, the fluctuations during the twelve months being from $45.25 to $47.50. The average price of Bessemer steel rails in May of last year was $65, and in June of this year it was $60, the fluctuations in the mean time ranging from $58 to $63.75. Best bar iron in May of last year averaged $56 a ton, and in June of this year it averaged $53.76, the intervening fluctuations ranging from $50 to $56. Nails fell in May and June of last year to $3 at Pittsburgh, and in June of this year they were firmly held at $2.75, the fluctuations in the mean time being between $2.60 and $3.25. At the time of writing this report, in the middle of July, the prices of iron and steel rails are higher than in June, while the June prices of pig iron, bar iron, and nails are firmly maintained. The prospect for the remainder of the year is that the extraordinary consumption which characterized the whole of the year 1880 and the first half of this year will continue, and that prices will not vary greatly from present quotations. More furnaces were in blast on the 1st of July this year than at the same time last year. The generally healthy condition of the foreign iron market at this time favors the presumption that prices here will experience no further depression. A material advance in prices is not expected on either side of the Atlantic.

The present activity in the iron and steel industries of this country is, of course, largely due to the revival in railroad building which occurred in 1879 and to the ability since that year of the owners of completed railroads to make needed repairs and extensions to their tracks and to increase their rolling stock. There is every indication that this year's demand by the railroad interests of the country will continue for at least another year, and beyond that period speculation would be unprofitable. In 1880 there were built in this country 7,174 miles of new railroad, and the construction of a still larger number of miles in the present year is fully assured. It is not probable that the mileage of new railroad in 1882 will fall be-

low that of 1880—the mining developments in the remote West and Southwest, the large influx of foreign emigrants, and the railroad schemes already undertaken being influential railway factors existing this year which will undoubtedly continue through the next year. At least 500,000 tons of rails have already been ordered from American mills for delivery in 1882. Some Mexican or Southwestern railway schemes may be discovered to be premature, and the New York stock market may experience a reaction from its present condition of activity and high prices, but these contingencies, if they should happen, will not seriously affect legitimate and much-needed railway enterprises which are now in progress. Apart from the influence of railroads our iron and steel industries are stimulated to-day by the remarkable prosperity of the whole country, which is real and tangible and not in any sense fictitious. It is based upon actual consumption of all products and the ability to pay for what is consumed. The balance of trade is in our favor and can not suddenly be wrested from us. Money is abundant, the crops are bountiful, political excitement is stilled, capital is confident, and labor is contented. These favorable conditions co-operate with railway influences to create the present large demand for our iron and steel products, and they are sure to continue into another year.

THE PRODUCTION OF 1880 COMPARED WITH THAT OF 1879.

The production of all iron and steel products in this country in 1880 was much greater than in 1879 or in any preceding year, and it promises to be greater in 1881 than in 1880. The following table shows the production in 1879 and 1880 of ten leading articles.

PRODUCTS.	1879. Net tons.	1880. Net tons.
Pig iron	3,070,875	4,295,414
All rolled iron, including nails and excluding rails	1,627,324	1,858,906
Bessemer steel rails	683,964	954,460
Open-hearth steel rails	9,149	13,615
Iron and all other rails	420,160	493,762
Kegs of cut nails and spikes, included in all rolled iron	5,011,021	5,370,512
Crucible steel ingots	56,780	72,424
Open-hearth steel ingots	56,200	112,953
Bessemer steel ingots	928,972	1,203,173
Blooms from ore and pig iron	62,353	74,589

PRICES OF PIG IRON IN 1880 AND 1881.

When we closed our last annual report at the middle of May,

1880, the price of No. 1 anthracite foundry pig iron at Philadelphia had fallen to $25 a ton, and it has since remained almost stationary. In February preceding the average price for the month had been $41, which was the highest that had been reached since the commencement of the "boom" of 1879. From February to May the price rapidly fell to $25. We give below the average monthly quotations for this quality of pig iron at Philadelphia for the whole of 1880 and the first six months of 1881.

January, 1880	$40 00	July, 1880	$23 50	January, 1881	$25 00
February, "	41 00	August, "	25 00	February, "	25 50
March, "	37 50	September, "	23 25	March, "	26 00
April, "	31 00	October, "	23 00	April, "	25 00
May, "	25 00	November, "	24 50	May, "	25 00
June, "	23 00	December, "	25 00	June, "	24 00

The following table shows the average yearly prices per gross ton of No. 1 anthracite foundry pig iron at Philadelphia during the past ten years, averaged from average monthly quotations.

1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
$35 12½	$18 87½	$42 75	$30 25	$25 50	$22 25	$18 87½	$17 62½	$21 50	$28 59

PRICES OF IRON AND STEEL RAILS IN 1880 AND 1881.

The price of iron rails during the "boom" reached its highest point in February, 1880, when the average quotation for the month was $68. From these figures the price rapidly receded until June, 1880, when the average for the month was $46.25, from which it has since varied but slightly. The average monthly prices for the whole of 1880 and the first six months of 1881 have been as follows.

January, 1880	$65 00	July, 1880	$45 00	January, 1881	$46 50
February, "	68 00	August, "	46 00	February, "	47 50
March, "	66 00	September, "	46 00	March, "	47 00
April, "	60 00	October, "	46 00	April, "	47 00
May, "	50 00	November, "	46 50	May, "	46 50
June, "	46 25	December, "	45 25	June, "	46 50

The average yearly prices at which iron rails have been sold in this country during the past ten years are given below, the quotations being per gross ton at the works in Eastern Pennsylvania.

1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
$70 37½	$85 12½	$76 66¾	$58 75	$47 75	$41 25	$35 25	$33 75	$41 25	$49 25

The highest average monthly quotation for Bessemer steel rails during the "boom" was in February, 1880, when it was $85. From these figures the price fell to $62.50 in July, 1880, from which the variations were but slight until July of this year, although a tendency to lower prices for future delivery is now manifested. The average monthly prices during the whole of 1880 and the first six months of 1881 have been as follows.

January, 1880	$75 00	July, 1880	$62 50	January, 1881	$60 00
February, "	85 00	August, "	63 75	February, "	62 00
March, "	82 00	September, "	61 25	March, "	62 50
April, "	75 00	October, "	60 00	April, "	63 00
May, "	65 00	November, "	59 00	May, "	63 00
June, "	63 75	December, "	58 00	June, "	60 00

The average yearly prices at which Bessemer steel rails have been sold in this country since 1868 are as follows, per gross ton, the figures given being the prices at the works in Pennsylvania.

Years.	Price.	Years.	Price.	Years.	Price.	Years.	Price.
1868...	$158 50	1872...	$112 00	1876....	$59 25	1880...	$67 50
1869...	132 25	1873...	120 50	1877...	45 50		
1870...	106 75	1874...	94 25	1878...	42 25		
1871...	102 50	1875...	68 75	1879...	48 25		

Monthly prices of pig iron, iron and steel rails, and bar iron for a long series of years will be found farther on in this report.

IMPORTS OF IRON AND STEEL FROM 1871 TO 1880.

The foreign value of the imports into the United States from all countries of iron and steel and manufactures thereof, including tin plates, has been as follows in the ten years from 1871 to 1880.

Years.	Values.	Years.	Values.
1871	$57,866,299	1877	$19,874,399
1872	75,617,677	1878	18,013,010
1873	60,005,538	1879	33,331,569
1874	37,652,192	1880	80,485,365
1875	27,363,101		
1876	20,016,603	Total	$430,223,753

The following table will show, in net tons, the quantities of all the leading iron and steel products imported into the United States from all countries in the ten years from 1871 to 1880 for which the tonnage can be obtained.

Commodities Imported.	1871.	1872.	1873.	1874.	1875.
Pig iron	245,535	295,967	154,708	61,165	83,932
Castings	492	497	262	74	26
Bar iron	122,565	89,576	62,253	26,876	27,542
Boiler iron	322	684	464	53	51
Band, hoop, and scroll iron	13,103	12,365	8,245	1,422	255
Railroad bars or rails, of iron	566,202	381,064	99,201	7,796	1,174
Railroad bars or rails, of steel*		149,786	159,571	100,515	18,274
Sheet iron	12,047	15,149	10,713	6,741	4,050
Old and scrap iron	220,340	278,257	108,838	40,633	28,947
Anchors, cables, and chains	5,434	5,875	4,668	3,219	2,245
Tin plates	92,925	95,904	108,858	89,351	101,981
Total	1,278,965	1,325,034	717,761	337,845	268,477

Commodities Imported. (*Continued.*)	1876.	1877.	1878.	1879.	1880.	1881. First 4 mos.
Pig iron	83,072	66,861	74,484	340,672	784,968	137,712
Castings	35	53	69	61	115	55
Bar iron	26,653	30,531	33,346	48,840	126,986	6,043
Boiler iron	15	2	1	91	168	33
Band, hoop, etc	144	159	7	1,031	25,322	10
Railroad bars of iron	287			19,090	132,459	29,477
Railroad bars of steel		35	10	25,057	158,230	39,216
Sheet iron	1,758	1,184	838	5,459	11,412	858
Old and scrap iron	14,149	10,903	6,225	248,429	694,272	39,630
Anchors, cables, etc	1,863	1,073	646	892	1,393	457
Tin plates	100,740	125,976	120,808	172,760	177,015	67,057
Total	228,716	236,777	236,434	862,382	2,112,340	320,548

* Previous to 1872 steel rails are reported under the head of iron rails.

In the above tables tin plates have for the first time been inserted among our iron and steel imports. They properly belong in this classification because nearly all of their weight and most of their value are due to the iron of which they are almost wholly composed. In the ten years from 1871 to 1880 our annual imports of tin plates almost doubled in quantity. During these ten years the value of our imports of tin plates reached the enormous sum of $122,148,817, nearly all of which expenditure abroad could have been saved to our country if the tariff on tin plates had been interpreted as it was intended that it should be. Our little tin-plate industry of a few years ago has been utterly crushed out of existence through a criminally erroneous Treasury decision which gave away the protection that Congress intended it to have. We can make as good sheet iron for tin plates as is made in the world, and we could import the tin as easily as Great Britain imports a large part of her supply of this metal. The cruel injury done to our tin-plate industry should be remedied at the first meeting of Congress. That this country should go on paying from ten to fifteen or sixteen millions of dollars every year for an article which we are ourselves capable

of producing is as great an absurdity and as grievous an offense as if we were by some legislative bounty to encourage the importation of Hungarian wheat or Russian petroleum.

The total importations in 1880 were the largest in our history. The causes which led to them were sufficiently explained in our last annual report, and need not be repeated. It is worthy of remark, however, that they were mainly of crude products or raw materials —pig iron and old iron footing up respectively 784,968 and 694,-272 net tons, whereas in 1871 and 1872 the heavy importations were mainly of iron and steel rails. It is gratifying to observe by the figures above given of importations for the first four months of 1881 that the total importations for the year will probably not amount to one-half those of last year. Low prices in this country and the ability to supply all our own wants, except iron and steel rails for immediate delivery, are now co-operating to restrict importations.

IMPORTS OF IRON ORE IN 1879, 1880, AND 1881.

The following statement shows the quantity and value of iron ore imported into the United States during the calendar years 1879 and 1880, and in the four months which ended April 30, 1881, by customs districts. Most of the ore was imported from Spanish and Mediterranean ports. Previous to 1879 the quantity of iron ore annually imported was not preserved by the Treasury Department.

Districts.	Year ended Dec. 31, 1879.		Year ended Dec. 31, 1880.		4 mos. ended April 30, 1881.	
	Gross tons.	Dollars.	Gross tons.	Dollars.	Gross tons.	Dollars.
Baltimore	27,090	60,869	170,308	506,560	94,217	257,340
Boston	701	2,438	2,155	13,359	.....	.....
Buffalo Creek	5,969	14,251	13,554	36,426	1,940	5,552
Champlain	12	31	.....	.....	.....	.....
Cuyahoga	550	1,128	13,858	48,463	.....	.....
Detroit	1,287	3,508	456	1,169	.....	.....
Genesee	2,125	4,101	5,390	16,274	1,107	3,130
Huron	.....	.....	72	258	118	322
Newark, N. J	.....	.....	269	798	.....	.....
New York	109,230	282,060	148,987	432,678	62,561	188,006
Oswegatchie	.....	.....	7,553	21,052	2,413	7,520
Oswego	884	2,130	4,185	7,860	.....	.....
Perth Amboy, N. J	9,634	29,010	5,444	15,968	2,861	8,416
Philadelphia	126,659	281,941	120,619	335,119	23,058	62,917
Puget's Sound	.....	.....	400	412	309	309
Cape Vincent	.....	.....	158	413	.....	.....
Total	284,141	681,467	493,408	1,436,809	188,575	533,512

It will be observed that during the year 1880 we imported almost 500,000 gross tons of iron ore, and that the importations for 1881 promise to exceed this large quantity. The high prices of Lake

Superior iron ores are assigned as the leading cause of these importations. The ore imported is almost wholly used in the manufacture of Bessemer pig iron near the Atlantic coast.

The annexed table shows in detail the value of the imports of iron ore during the fiscal years from June 30, 1869, to June 30, 1880. As the invoice value of all the ore imported prior to 1879, when the tonnage of iron ore imports was first recorded, was about $2 a ton, the quantity imported down to that year may be approximately ascertained by dividing the value of the imports by two.

Fiscal Years.	New York.	Boston.	Baltimore.	San Francisco	Lake Ports.	Philadelphia.	Other Ports.	Total.
1870.....	.....	.....	.....	.....	$34,439	....	$165	$34,604
1871.....	$153	.....	.....	.....	66	.....	143	362
1872	2,116	.....	.....	.....	49,607	.....	1,590	53,313
1873.....	29,152	$1,434	.....	$385	92,856	.....	575	124,402
1874.....	21,544	175	$11,520	.....	105,167	.....	110	138,514
1875.....	16,253	.....	.....	.....	74,425	$55,896	85	146,659
1876.....	12,030	.....	.....	....	32,446	7,692	673	52,841
1877.....	25,466	.....	4,235	....	18,627	34,388	231	82,947
1878.....	16,553	.....	2,399	.....	13,088	29,485	1,262	62,787
1879.....	109,936	2,429	4 497	.....	8,943	203,051	14,178	343,034
1880.....	362,492	561	446,320	.....	79,386	310,184	24,018	1,192,961

DOMESTIC EXPORTS OF IRON AND STEEL IN 1880.

Our export trade in iron and steel made little progress in 1880 over 1879. The value of the exports from the United States to all countries of domestic iron and steel and manufactures thereof in the ten years from 1871 to 1880 was as follows.

Years.	Values.	Years.	Values.	Years.	Values.
1871.....	$11,836,137	1875.....	$16,092,906	1879.....	$12,470,448
1872.....	10,030,125	1876.....	11,798,459	1880.....	12,960,995
1873.....	12,129,939	1877.....	16,659,675		
1874.....	15,389,807	1878.....	13,260,369		

Full details of these exports will be found elsewhere in this report. It will be observed that our exports of iron and steel and their manufactures have been practically stationary during the past ten years, the causes of which we have often explained.

GENERAL SUMMARY OF THE PRODUCTION OF IRON AND STEEL IN THE UNITED STATES DURING THE PAST NINE YEARS.

The appended table shows in tons of 2,000 pounds the production of all kinds of iron and steel in the United States from 1872 to

1880. We regret that it does not also include the production for 1871, so that the statistics for the whole decade could have been given. We did not collect the statistics for that year.

Products.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Pig iron	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236	2,314,585	2,577,361	3,070,875	4,295,414
All rolled iron, including nails and iron rails	1,847,922	1,837,430	1,694,616	1,599,516	1,509,269	1,476,759	1,565,576	2,047,484	2,332,668
All rolled iron, including nails and excluding rails	911,992	1,076,368	1,110,147	1,097,867	1,042,101	1,141,219	1,222,686	1,627,324	1,838,906
Bessemer steel rails	91,070	129,015	144,944	290,863	412,461	432,169	550,398	683,964	954,460
Open-hearth steel rails	.....	.....	.....	.....	.....	.....	9,897	9,149	13,647
Iron and all other rails	965,930	761,062	584,469	501,619	467,168	332,540	322,890	420,160	466,762
Rails of all kinds	1,000,000	890,077	729,413	792,512	879,629	764,709	882,685	1,113,273	1,461,837
Kegs of cut nails and spikes, included in all rolled iron	4,065,322	4,024,764	4,042,180	4,726,881	4,157,814	4,828,918	4,396,130	5,011,921	5,370,512
Crucible steel ingots	29,260	34,785	36,328	39,401	39,382	40,430	42,906	56,780	72,421
Open-hearth steel ingots	3,000	3,500	7,000	9,050	21,490	25,031	36,126	56,299	112,953
All other steel, except Bessemer	7,740	13,714	6,353	12,667	10,306	11,921	8,556	5,464	8,465
Bessemer steel ingots	120,108	170,652	191,933	375,517	525,996	560,587	732,226	928,972	1,202,173
Blooms from ore and pig iron	58,000	62,564	61,670	49,243	44,628	47,300	50,045	62,353	74,589
Spiegeleisen, included in pig iron	.....	.....	.....	7,832	6,916	8,845	10,674	13,931	19,663

THE PRODUCTION OF PIG IRON IN 1880.

The production of pig iron in the United States in 1880 was 4,295,414 net tons, or 3,835,191 gross tons. The production in 1879

was 3,070,875 net tons, or 2,741,853 gross tons. The increase in 1880 over 1879 was, therefore, 1,224,539 net tons, or 1,093,338 gross tons, or 40 per cent. The production of 1879 was larger than that of any preceding year, but the production of 1880 was not only 40 per cent. larger than that of 1879, but it was 50 per cent. larger than that of either of the two preceding most productive years, 1872 and 1873, and it was *double* that of the Centennial year, 1876, when the production of pig iron during the panic years reached its lowest point. The following figures, in net tons, will make these extraordinary facts plain to the eye. Production:

1872	2,854,558	1877	2,314,585
1873	2,868,278	1878	2,577,361
1874	2,689,413	1879	3,070,875
1875	2,266,581	1880	4,295,414
1876	2,093,236		

Of the total production of pig iron in 1880, 1,807,651 net tons were made with anthracite coal; 1,950,205 tons with bituminous coal and coke; and 537,558 tons with charcoal. The increased production of the year over the product of 1879 was very evenly divided among the different fuels. It is, however, worthy of notice that the production of charcoal pig iron in both 1879 and 1880 has increased at a more rapid rate than that of anthracite and bituminous pig iron. In the three years preceding 1879 it had declined relatively as compared with its two rivals. In 1879 the increase in the production of anthracite pig iron over 1878 was 16.5 per cent.; that of bituminous pig iron was 20.8 per cent.; and that of charcoal pig iron was 22.3 per cent. In 1880 the increase in production over 1879 was as follows: anthracite, 41.9 per cent.; bituminous, 35.5 per cent.; charcoal, 49.8 per cent. The charcoal iron product of 1880 has only twice been exceeded in our history—in 1873 and 1874, when the production was respectively 577,620 and 576,557 net tons.

As has heretofore been the case, some of the anthracite furnaces used more or less coke in 1880 as a mixture, and a smaller number of bituminous furnaces used anthracite as a mixture. The exact quantity of pig iron produced in 1880 with this mixed fuel was 714,631 net tons. Counting all pig iron produced with mixed fuel as if it had been wholly made with the fuel chiefly used in the mixture, whether anthracite or bituminous coal, the quantity of pig iron smelted with anthracite coal, bituminous coal, or charcoal from 1872 to 1880 was as follows, in net tons:

FUEL USED.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Anthracite	1,369,812	1,312,754	1,202,144	908,046	794,578	934,797	1,092,870	1,273,024	1,807,651
Bituminous	984,159	977,904	910,712	917,545	990,009	1,061,945	1,191,092	1,438,978	1,950,205
Charcoal	500,587	577,620	576,557	410,990	308,649	317,843	293,399	358,873	537,558
Total	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236	2,314,585	2,577,361	3,070,875	4,295,414

Of the total production of charcoal pig iron in 1880, (537,558 tons,) Michigan produced the extraordinary quantity of 154,424 tons. No other State produced half as many tons of charcoal pig iron, Ohio approximating this quantity most closely with 69,190 tons.

The production of pig iron in 1880 in the pig-iron producing States was as follows:

STATES.	Net tons.	STATES.	Net tons.
Pennsylvania	2,083,121	Virginia	29,934
Ohio	674,207	Georgia	27,321
New York	395,361	Connecticut	22,583
New Jersey	170,049	Massachusetts	19,017
Michigan	154,424	Indiana	12,500
Illinois	150,556	Oregon	5,000
Missouri	105,555	Maine	3,578
Wisconsin	96,842	Minnesota	3,520
Alabama	77,190	Texas	2,500
Tennessee	70,873	Vermont	1,800
West Virginia	70,338		
Maryland	61,437	Total	4,295,414
Kentucky	57,708		

Twenty-three States made pig iron in 1880, one more than in 1879, Minnesota entering the list for the first time with her Duluth charcoal furnace—the pioneer, we have no doubt, of many other iron enterprises in her borders. North Carolina has not made any pig iron since 1877, but it is expected that she will blow in a blast furnace this year. Oregon, with her Oswego charcoal furnace, doubled in 1880 her production of 1879. Another State, Colorado, has its first furnace, at South Pueblo, ready to be put in blast. California and Washington Territory are now making pig iron for the first time, a furnace in each having been blown in since January last. Utah Territory has made no pig iron since 1876, but the largest and best of its two furnaces, the one at Ogden, is likely to be blown in this year.

Every State in the Union that made pig iron in 1879, except one, increased its production in 1880. The exception was West Virginia, which made 70,801 net tons in 1879 and 70,338 tons in

1880. In 1879 Pennsylvania made 52⅓ per cent. of the total production; in 1880 her production declined relatively to 48½ per cent. Ohio made a very sharp advance in 1880 upon her record of 1879. In 1879, with a product of 447,751 net tons, her percentage of the total product of the country was 14⅔; in 1880, with a product of 674,207 net tons, her percentage was 15⅝. The States which ranked next to Pennsylvania and Ohio in production in 1880, and which produced over 100,000 tons each, were New York, New Jersey, Michigan, Illinois, and Missouri, in the order named.

All of the Pennsylvania and Ohio districts increased their production in 1880 over 1879. Full details of the production of each district from 1872 to 1880 will be found in a table on page 45.

There was a gratifying increase in 1880 in the production of spiegeleisen. The product was 19,603 net tons, against 13,931 tons in 1879, 10,674 tons in 1878, 8,845 tons in 1877, 6,616 tons in 1876, and 7,832 tons in 1875. The product of 1879 and 1880 was made by the New Jersey Zinc Company and the Oxford Iron Company, in New Jersey, and by the Bethlehem Iron Company, the Cambria Iron Company, and the Edgar Thomson Steel Company, in Pennsylvania.

The stocks of domestic pig iron on hand and unsold in the hands of makers or their agents at the close of 1880 aggregated 456,658 net tons, against 141,674 tons in 1879, 574,565 tons in 1878, 642,351 tons in 1877, 686,798 tons in 1876, 760,908 tons in 1875, and 795,784 tons in 1874. The quantity of foreign pig iron in the warehouses of the country at the close of 1880 amounted to 164,404 gross tons, or 184,132 net tons. At the same time large quantities of foreign pig iron which had been withdrawn from warehouse were in the hands of importers, speculators, or creditors—probably 100,000 tons in all. The quantity of foreign pig iron now in warehouse or otherwise held in this country is less than in December last.

The consumption of pig iron in 1880 can only be approximated. We produced 3,835,191 gross tons, and imported the unusually large quantity of 700,864 tons, giving a total supply of 4,536,055 gross tons. We increased the stocks of domestic pig iron during the year the difference between 126,494 gross tons held at the close of 1879 and 407,730 gross tons held at the close of 1880, or 281,236 tons. At the close of 1880 there also remained in warehouse 164,404 gross tons of imported pig iron, and in the hands of speculators and others about 100,000 tons of imported pig iron. Adding the increase of domestic stocks to the foreign stocks we have 545,640

gross tons to be deducted from the total supply, which gives us 3,990,415 gross tons as the probable consumption of the year.

Full details of production and stocks on hand will be found in accompanying tables.

The year 1880 was a very active one in furnace construction in the United States. No less than 28 furnaces were built; 23 more were begun; 1 furnace long abandoned was revived; and many others were wholly or partly rebuilt or supplied with new and improved appliances to secure increased production and greater economy of fuel. Of the furnaces completed in 1880, there were 10 in Pennsylvania, 6 in Virginia, 2 in Alabama, 2 in Tennessee, 3 in Illinois, 2 in Michigan, and one each in Minnesota, Missouri, and Colorado. Of the additional furnaces which were in course of erection in 1880, there were 12 in Pennsylvania, 2 in Tennessee, 4 in Illinois, and one each in Virginia, Michigan, Missouri, California, and Washington Territory. During 1880 we marked off our list 17 furnaces which we regarded as having been abandoned. The total number of furnaces on our list at the close of 1880 was 701, against 697 at the close of 1879. The following figures represent the completed furnaces at the close of each of the last nine years.

1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
612	657	693	713	712	716	692	697	701

Of the 701 completed furnaces at the close of 1880, there were 446 in blast, against 388 at the close of 1879, and 265 at the close of 1878. At the close of 1880 there were 255 furnaces out of blast, against 309 at the close of 1879, and 427 at the close of 1878. Of the furnaces in blast at the close of 1880, 140 were bituminous, 155 were anthracite, and 151 were charcoal—total, 446. Of the furnaces out of blast at the same time, 73 were bituminous, 71 were anthracite, and 111 were charcoal—total, 255. Of the whole number of furnaces at the close of 1880, 213 were classed as bituminous, 226 as anthracite, and 262 as charcoal—total, 701. The number of furnaces out of blast at the close of 1880 was still large, but it should be remembered that a number of furnaces always must be out of blast while undergoing repairs or waiting for fuel, while others are undesirably situated or are old-fashioned in construction and must eventually be abandoned. The following table shows the number of furnaces in blast and out of blast at the close of 1880 in each of the pig-iron producing States.

STATES.	In Blast.	Out of Blast.	Total.
Maine	1		1
Vermont	1		1
Massachusetts	5		5
Connecticut	8	2	10
New York	44	13	57
New Jersey	10	10	20
Pennsylvania	189	85	274
Maryland	10	13	23
Virginia	13	24	37
North Carolina		7	7
Georgia	4	6	10
Alabama	13	2	15
West Virginia	7	4	11
Kentucky	8	14	22
Tennessee	13	12	25
Texas	1		1
Ohio	76	27	103
Indiana	3	1	4
Illinois	8	5	13
Missouri	5	11	16
Michigan	14	13	27
Wisconsin	11	3	14
Minnesota	1		1
Colorado		1	1
Utah		2	2
Oregon	1		1
Total	446	255	701

The following table shows the number of furnaces in blast and out of blast at the close of 1880 in the pig-iron districts of Pennsylvania and Ohio.

	DISTRICTS.	In Blast.	Out of Blast.	Total.
Pennsylvania.	Lehigh Valley	41	9	50
	Schuylkill Valley	28	19	47
	Upper Susquehanna Valley	15	10	25
	Lower Susquehanna Valley	26	10	36
	Shenango Valley	13	17	30
	Allegheny County	11	4	15
	Miscellaneous Bituminous	28	8	36
	Charcoal	27	8	35
Ohio.	Hanging Rock Region	34	12	46
	Mahoning Valley	13	4	17
	Hocking Valley	10	4	14
	Other Bituminous and Charcoal	19	7	26

PRODUCTION OF BESSEMER STEEL IN 1880.

The total quantity of Bessemer steel ingots produced in the United States in 1880 was 1,203,173 net tons, or 1,074,262 gross tons, against 928,972 net tons in 1879, 732,226 net tons in 1878, and 560,587 net tons in 1877. The increase over 1879 was 274,201

net tons, or 30 per cent.; over 1878 it was 470,947 net tons, or 64 per cent.; over 1877 it was 642,586 net tons, or 115 per cent. The production of Bessemer steel ingots in this country from 1872 to 1880 has been as follows, in net tons.

1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
120,108	170,652	191,933	375,517	525,996	560,587	732,226	928,972	1,203,173

The production of Bessemer steel rails in 1880 was 954,460 net tons, or 852,196 gross tons, against 683,964 net tons produced in 1879, 550,398 net tons in 1878, and 432,169 net tons in 1877. Of the whole quantity of Bessemer steel rails produced in 1880 there were rolled 36,868 net tons in iron rolling mills, mainly from imported blooms. The quantity of rails thus produced will be greater in 1881 than in 1880, but after this year we look for a sharp decline. The business was created by the exigencies arising from the sudden revival of a demand for steel rails in 1879.

The production of Bessemer steel rails in this country since 1867, when they were first made to fill orders, has been as follows.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1867.....	2,550	1872.....	94,070	1877.....	432,169
1868.....	7,225	1873.....	129,015	1878.....	550,398
1869.....	9,650	1874.....	144,944	1879.....	683,964
1870.....	34,000	1875.....	290,863	1880.....	954,460
1871.....	38,250	1876.....	412,461		

The production of Bessemer steel ingots in 1880 was confined to eleven works. All of these were in constant operation during the year, with the exception of the Vulcan works at St. Louis, which resumed operations March 10, 1880, and have since been steadily employed. The eleven works which were in operation in 1880 used 24 converters—the Bethlehem works having four and all the others two each. The works of the Pittsburgh Bessemer Steel Company Limited, located at Homestead, near Pittsburgh, were successfully started on March 19th of the present year. The Homestead works have two converters. The whole number of converters in use in this country on the 1st of July of this year was 26 The probabilities are that the number and capacity of the Bessemer works in the country will be so increased during this year that at its close their annual capacity will be fully 1,750,000 net tons of ingots. A production this year of 1,250,000 net tons of Bessemer steel rails, and next year of 1,500,000 net tons, is possible and probable.

Some preparations have been made to introduce into this country the Thomas-Gilchrist basic process for the manufacture of Bessemer steel, but we do not look for any practical results to follow for some time to come, and then at only two establishments.

Great Britain's production of Bessemer steel and its production of Bessemer steel rails in 1880 were both exceeded by the United States, as will appear from the following comparison, in gross tons:

Production of Bessemer steel ingots by the United States in 1880	1,074,262
" " " " " Great Britain "	1,044,382
Excess of production by the United States	29,880
Production of Bessemer steel rails by the United States in 1880	852,196
" " " " " Great Britain "	739,910
Excess of production by the United States	112,286

PRODUCTION OF ALL KINDS OF STEEL IN 1880.

The production of crucible steel ingots in the United States in 1880 was 72,424 net tons, a gain of 15,644 tons upon the production of 56,780 tons in 1879. The production of blister and puddled steel, and of steel made by various minor processes, was 8,465 net tons in 1880, against 5,464 tons in 1879, 8,556 tons in 1878, and 11,924 tons in 1877. The production of open-hearth steel ingots in 1880 was 112,953 net tons, against 56,290 tons in 1879, 36,126 tons in 1878, and 25,031 tons in 1877. The following table gives the production of crucible steel ingots from 1874 to 1880, in net tons.

STATES.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
New England	1,509	1,620	1,098	1,974	1,602	1,608	660
New York	2,686	2,300	2,300	2,032	2,800	2,300	3,500
New Jersey	8,164	7,098	6,806	6,749	7,377	8,651	10,387
Pennsylvania	23,289	26,615	28,217	27,983	30,585	43,614	57,077
Western States	570	1,500	700	1,400	480	605	800
Southern States	100	268	261	292	62	2	.....
Total	36,328	39,401	39,382	40,430	42,906	56,780	72,424

The following table gives the production of blister, puddled, and "patented" steel from 1874 to 1880, in net tons.

STATES.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
New England	376	1,500	.....	.....	192	950	72
New York	200	.....	139	.....	220	215	617
New Jersey	.....	100	652	.....	.....	.....	.....
Pennsylvania	4,417	7,340	7,601	9,870	8,069	3,004	6,658
Western States	1,300	.....	1,700	2,034	75	1,000	1,018
Southern States	60	3,667	214	20	.....	295	100
Total	6,353	12,607	10,306	11,924	8,556	5,464	8,465

The following table gives the production of open-hearth steel ingots from 1874 to 1880, in net tons.

STATES.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
New England.....	5,300	3,010	6,085	6,652	8,228	14,660	20,560
New Jersey and Pennsylvania...	1,700	4,240	7,547	7,771	12,231	19,575	50,736
Western & Southern States.....	.....	1,800	7,858	10,608	15,667	22,055	41,657
Total.....	7,000	9,050	21,490	25,031	36,126	56,290	112,953

The following table gives in net tons the production of all kinds of steel except Bessemer and open-hearth steel from 1865 to 1880, and includes crucible steel ingots, blister steel, and steel made by various minor processes.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1865.....	15,262	1871.....	37,000	1877.....	52,354
1866.....	18,973	1872.....	37,000	1878.....	51,462
1867.....	19,000	1873.....	48,500	1879.....	62,244
1868.....	21,500	1874.....	42,681	1880.....	80,889
1869.....	23,000	1875.....	52,008	.....	.....
1870.....	35,000	1876.....	49,688	.....	.....

The following table gives in net tons the production of all kinds of steel from 1872 to 1880.

KINDS OF STEEL.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Bessemer steel ingots.....	120,108	170,652	191,933	375,517	525,996	560,587	732,226	928,972	1,203,173
Crucible steel ingots.....	29,260	34,786	36,328	39,401	39,382	40,430	42,906	56,780	72,424
Open-hearth steel ingots..	3,000	3,500	7,000	9,050	21,490	25,031	36,126	56,290	112,953
All other steel	7,740	13,714	6,353	12,607	10,306	11,924	8,556	5,464	8,465
Total.....	160,108	222,652	241,614	436,575	597,174	637,972	819,814	1,047,506	1,397,015

PRODUCTION OF BARS, ANGLES, PLATES, SHEETS, AND OTHER ROLLED IRON IN 1880.

By the term rolled iron we include (1) cut nails and spikes; (2) bar, angle, bolt, rod, skelp, and hoop iron; (3) plate and sheet iron; and (4) all sizes of iron rails. Bessemer steel rails are not classed among rolled iron products.

The production of all kinds of rolled iron in the United States in 1880, including iron rails, was 2,332,668 net tons, which was an increase of 285,184 tons over the production of 2,047,484 tons in 1879. In 1879 the production was 491,908 tons more than that of 1878.

The increase in production in 1880 was therefore very much less than in 1879. The explanation doubtless is that in the last half of 1879, when the "boom" was in full force, large stocks of merchant iron were piled up in warehouses and were not sold until 1880.

The following table gives the production of all kinds of rolled iron from 1864 to 1880, in net tons.

Years.	Iron Rails.	Other Rolled Iron.	Total.
1864	335,369	536,958	872,327
1865	356,292	500,048	856,340
1866	430,778	595,311	1,026,089
1867	459,558	579,838	1,039,396
1868	499,489	598,286	1,097,775
1869	583,936	642,420	1,226,356
1870	586,000	705,000	1,291,000
1871	737,483	710,000	1,447,483
1872	905,930	941,992	1,847,922
1873	761,062	1,076,368	1,837,430
1874	584,469	1,110,147	1,694,616
1875	501,649	1,097,867	1,599,516
1876	467,168	1,042,101	1,509,269
1877	332,540	1,144,219	1,476,759
1878	322,890	1,232,686	1,555,576
1879	420,160	1,627,324	2,047,484
1880	493,762	1,838,906	2,332,668

The production of all kinds of rolled iron from 1873 to 1880 was distributed among the States as follows:

States—Net Tons.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Maine	21,210	18,644	8,100	10,814	6,299	6,642	6,483	7,639
New Hampshire	300	300	1,000	1,900	1,900	550	3,000	3,100
Vermont	6,088	10,400	6,204	9,183	3,899	700	3,300	1,650
Massachusetts	118,669	100,500	99,712	78,576	97,293	85,660	105,085	114,250
Rhode Island	11,662	10,616	9,584	7,394	7,500	8,000	9,800	7,632
Connecticut	11,469	11,921	9,618	10,114	7,298	10,138	13,486	16,016
New York	135,406	121,029	142,746	104,596	67,013	84,536	115,201	147,601
New Jersey	77,688	58,081	55,249	52,411	49,228	51,632	62,831	64,622
Pennsylvania	788,051	731,267	625,987	620,510	625,465	677,774	917,638	1,032,602
Delaware	11,617	11,818	15,252	17,598	18,249	14,427	26,923	29,806
Maryland	58,025	68,891	46,687	31,181	21,233	10,575	25,318	40,032
District of Columbia						82	230	276
Virginia	12,808	16,688	18,843	17,306	17,592	22,424	31,675	37,734
Georgia	10,624	9,467	10,325	12,001	13,101	10,122	13,692	1,507
Alabama	500	1,000	1,000	1,000	700	500	1,000	6,664
West Virginia	51,796	56,332	54,299	49,636	57,150	53,483	67,290	63,601
Kentucky	37,955	34,548	33,961	30,874	45,788	37,000	64,096	51,406
Tennessee	16,561	15,926	13,745	23,274	17,902	20,280	23,969	25,402
Ohio	247,834	203,097	209,620	209,178	208,109	203,222	238,925	308,566
Indiana	36,006	35,507	41,073	55,262	69,520	64,115	66,678	80,428
Illinois	105,143	85,813	89,487	57,708	46,535	85,797	112,714	109,429
Michigan	8,542	8,208	3,450	5,325	3,200	4,855	12,276	19,804
Wisconsin	39,495	29,955	42,840	29,980	33,279	45,300	61,333	64,890
Missouri	22,621	36,387	31,540	30,956	20,776	18,001	22,096	26,558
Wyoming Territory			7,000	12,320	10,007	10,425	9,656	9,821
Kansas		2,000	5,000	14,767	16,261	14,485	14,437	37,985
California	7,420	16,221	14,194	15,465	11,542	13,251	15,952	15,277
Colorado						1,600	2,500	4,500
Nebraska							500	3,000
Total	1,837,430	1,694,616	1,599,516	1,509,269	1,476,759	1,555,576	2,047,484	2,332,668

Detailed information concerning the production by each State

from 1873 to 1880 will be found farther on in this report, except of cut nails and spikes, which is given below, in kegs of 100 pounds.

States.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Maine	.....	.....	7,000	.....	.....	.....	.....	.....
Massachusetts	626,465	576,376	551,798	446,638	556,341	476,863	430,240	532,299
Rhode Island.	73,249	68,920	58,730	9,966	.....	.....	.....	.....
New York.....	84,438	118,985	81,263	71,591	76,147	46,470	10,100	7,482
New Jersey....	456,537	552,867	522,198	342,391	303,852	254,453	294,182	291,122
Pennsylvania.	1,195,609	1,503,019	1,318,259	1,368,163	1,591,924	1,349,714	1,386,925	1,737,560
Virginia	106,922	112,034	121,976	119,426	118,691	127,970	139,076	123,728
Georgia.....	10,183	.....	9,300	15,000	24,000	.....	.....	.....
West Virginia	878,053	1,084,027	1,035,772	908,934	989,414	899,140	1,083,897	1,025,155
Kentucky	.....	102,411	143,473	99,161	135,000	80,000	161,800	120,900
Tennessee.....	.....	13,210	9,795	8,609	40,047	64,191	104,039	64,503
Ohio	460,618	545,052	592,768	573,439	594,336	610,245	794,230	824,683
Indiana.....	98,530	150,279	185,988	194,296	272,748	277,860	294,695	289,948
Illinois.....	33,500	85,000	88,561	200	127,015	218,224	301,837	290,132
Nebraska.....	.....	.....	.....	.....	.....	.....	10,000	60,000
Total.....	4,024,704	4,912,180	4,726,881	4,157,814	4,828,918	4,396,130	5,011,021	5,370,512

The production of cut nails and cut spikes in 1879 was 614,891 kegs greater than in 1878, but in 1880 it was only 359,491 kegs greater than in 1879. In 1879 there was an over-production, which prevented as great an increase in the make of 1880 over 1879 as there had been in 1879 over that of 1878.

PRODUCTION OF IRON AND STEEL RAILS IN 1880.

The production of rails of all kinds in the United States in 1880 far surpassed that of any previous year. It reached the enormous quantity of 1,461,837 net tons, or 1,305,212 gross tons. This is 31 per cent. more than the production of the next most productive year, 1879, in which 1,113,273 net tons, or 993,993 gross tons, of iron and steel rails were made.

The rail product of 1880 was composed of 954,460 net tons of Bessemer steel rails, 493,762 tons of iron rails, and 13,615 tons of open-hearth steel rails. The total production of 1880 was 348,564 net tons more than that of 1879; that of Bessemer steel rails was 270,496 net tons, or 40 per cent., more; that of iron rails was 73,602 tons, or 18 per cent., more; and that of open-hearth steel rails was 4,466 tons, or 49 per cent., more. The Bessemer steel rail production here given includes 36,868 net tons of rails rolled by iron rolling mills mainly from imported blooms. The quantity of Bessemer steel rails rolled in 1880 by the Bessemer steel makers themselves was 917,592 net tons.

The production of street rails in 1880 is included in the total production for the year, and amounted to 16,894 net tons, of which

8,055 tons were Bessemer and open-hearth steel rails, and the remainder were iron rails. The production of street rails in the seven preceding years was as follows: 1873, 9,430 net tons; 1874, 6,739 tons, of which 1,000 tons were Bessemer steel; 1875, 16,340 tons, of which 2,308 tons were Bessemer steel; 1876, 13,086 tons, of which 3,563 tons were Bessemer steel; 1877, 7,015 tons, of which 1,269 tons were Bessemer steel; 1878, 9,229 tons, of which 1,710 tons were Bessemer and open-hearth steel; 1879, 8,646 tons, of which 5,813 tons were Bessemer and open-hearth steel.

The production of iron and steel rails in this country since the beginning of the manufacture of Bessemer steel rails has been as follows, in net tons.

Years.	Open-Hearth Steel Rails.	Iron Rails, all kinds.	Bessemer Steel Rails.	Total.
1867	.....	459,558	2,550	462,108
1868	.....	499,489	7,225	506,714
1869	.....	583,936	9,650	593,586
1870	.....	586,000	34,000	620,000
1871	.....	737,483	38,250	775,733
1872	.....	905,930	94,070	1,000,000
1873	.....	761,062	129,015	890,077
1874	.....	584,469	144,944	729,413
1875	.....	501,649	290,863	792,512
1876	.....	467,168	412,461	879,629
1877	.....	332,540	432,169	764,709
1878	9,397	322,890	550,398	882,685
1879	9,149	420,160	683,964	1,113,273
1880	13,615	493,762	954,460	1,461,837

Included in the column of iron rails are a few tons of crucible steel rails and steel-headed rails, which it has not been thought necessary to classify separately. No crucible rails have been made since 1874, and but a few tons in that or in any preceding year. The production of both the classes of rails mentioned was as follows in 1873 and 1874: 1873, 26,377 net tons; 1874, 17,181 tons. The production of steel-headed rails in the last six years has been as follows: 1875, 19,436 net tons; 1876, 12,791 tons; 1877, 5,844 tons; 1878, 2,288 tons; 1879, 9,831 tons; 1880, 12,730 tons. The Elmira Iron and Steel Rolling Mill Company, at Elmira, New York, made all the steel-headed rails that were made in 1879 and 1880, using "silicon tops."

The production of rails of all kinds in the United States from 1849 to 1880 has been as follows, in net tons. Their manufacture in this country was commenced in 1844.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1849.....	24,318	1857.....	161,918	1865.....	356,292	1873.....	890,077
1850.....	44,083	1858.....	163,712	1866.....	430,778	1874.....	729,413
1851.....	50,603	1859.....	195,451	1867.....	462,108	1875.....	792,512
1852.....	62,478	1860.....	205,028	1868.....	506,714	1876.....	879,629
1853.....	87,864	1861.....	189,818	1869.....	593 586	1877.....	764,709
1854.....	108,016	1862.....	213,912	1870.....	620,000	1878.....	882,685
1855.....	138,674	1863.....	275,768	1871.....	775,733	1879.....	1,113,273
1856.....	189,018	1864.....	335,569	1872.....	1,000,000	1880.....	1,461,837

On page 47 will be found a table which gives the production by States of rails of all kinds in the United States from 1871 to 1880, or during the past ten years. The increase in production in 1880 over 1871 was 686,104 net tons, or 88 per cent. As will be seen by reference to the first of the two tables above given this increase is wholly in steel rails, the production of iron rails having declined from 737,483 tons in 1871 to 493,762 tons in 1880, or 33 per cent. It is noticeable, however, that the production of iron rails sensibly increased in 1879 and 1880 over immediately preceding years. It will undoubtedly be larger this year than in 1880. The following table shows the total quantity of iron and steel rails made in each of the States in 1880.

STATES.	Net tons.	STATES.	Net tons.
Pennsylvania	670,198	Massachusetts	9,672
Illinois	322,883	Wyoming Territory	9,421
Ohio	133,487	Maryland	6,887
New York	109,921	California	4,722
Indiana	41,523	Colorado	4,500
Missouri	35,746	West Virginia	2,155
Wisconsin	30,207	Georgia	485
Kansas	29,085	Alabama	300
Tennessee	18,552	Virginia	107
Vermont	17,650		
Kentucky	14,336	Total	1,461,837

Nineteen States and one Territory made rails in 1880. Alabama and Virginia entered the list for the first time, though all the rails made in Alabama and nearly all of those made in Virginia were street rails. The mill in Alabama is not intended to roll heavy rails, but the mill in Virginia is now at work on such rails. The largest absolute increase in the production of any State in 1880 over that of 1879 was made by Pennsylvania, which was 171,862 net tons—an increase which enabled that State to hold its own in the total production of the country. The increase by Pennsylvania was almost exactly one-half of the increase of the entire

country in 1880 over 1879. The increase of Illinois was 57,583 net tons; of Missouri, 35,746 tons, being its entire product, it having made no rails in 1879; of New York, 31,287 tons; of Ohio, 24,101 tons; of Kansas, 18,877 tons. The largest relative increase over the production of 1879 was in the State of Vermont—255 per cent. Maryland gained 188 per cent.; Kansas, 185 per cent.; Colorado, 80 per cent.; New York, 40 per cent.; Pennsylvania and Indiana, each 34 per cent.; Massachusetts, 25 per cent.; Illinois, Ohio, and Tennessee, each 22 per cent. In the States of Wisconsin, Kentucky, California, West Virginia, and Georgia, and in the Territory of Wyoming a less quantity of rails was produced in 1880 than in 1879. The great falling off in Georgia is due to the closing of the mill at Atlanta for almost the entire year, it having only started up again in December, 1880. There were no rails made in 1880 in the States of Maine, New Jersey, and Michigan, although they all possess mills which formerly made rails but are now running on other products.

In 1875 Pennsylvania's percentage of the total production of the year was 32.19; in 1876 it was 40.24; in 1877 it was 45.50; in 1878 it was 46.03; in 1879 it was 44.76; and in 1880 it was 45.85.

The percentage of production of all kinds of rails in 1880 by other States was as follows: Illinois, 22; Ohio, 9; New York, 7; Indiana, 3; Missouri, Wisconsin, and Kansas, each 2; Tennessee and Vermont, each 1; all other States and Wyoming Territory, each less than 1 per cent.

The production of 1880, large as it was, will be exceeded in 1881. Not only does the heavy demand for rails continue, but the facilities for their manufacture are being largely increased. The new works of the Pittsburgh Bessemer Steel Company Limited, at Homestead, which were started on March 19th of this year, are making rails. The Bessemer steel works of the Colorado Coal and Iron Company and the new steel works of the North Chicago Rolling Mill Company will probably manufacture rails before the close of the year. Nearly all of the other Bessemer steel works are increasing their capacity for the manufacture of rails, and the effect of their enlarged capacity will be noticeable before the year is over. Iron rail mills were actively employed during the first half of the year, and in many cases were running on steel rails rolled from imported blooms or from blooms furnished by domestic steel makers.

The following table will show approximately the consumption of rails in this country from 1867 to 1880, in net tons.

Years.	Made in United States.	Imported.		Approximate Consumption.
		Iron.	Steel.	
1867	462,108	163,049		625,157
1868	506,714	250,081		756,795
1869	593,586	313,163		906,749
1870	620,000	399,153		1,019,153
1871	775,733	566,202		1,341,935
1872	1,000,000	381,064	149,786	1,530,850
1873	890,077	99,201	159,571	1,148,849
1874	729,413	7,796	100,515	837,724
1875	792,512	1,174	18,274	811,960
1876	879,629	287	None	879,916
1877	764,709	None	35	764,744
1878	882,685	None	10	882,695
1879	1,113,273	19,690	25,057	1,157,420
1880	1,461,837	132,459	158,230	1,752,726

The figures of approximate consumption for 1880 are too high, although for the other years we think they are substantially correct. In 1880 we imported 132,459 net tons of iron rails and 158,230 tons of steel rails, all of which are counted in the approximate consumption of the year. But there remained in bonded warehouses at the close of 1880 no less than 39,912 net tons of iron rails and 38,379 net tons of steel rails, which should be deducted from the year's importations in estimating the consumption of the year. At the close of 1879 there were only 1,820 net tons of iron rails in bond, and no steel rails. Deducting the iron and steel rails in bond at the close of 1880, we find the consumption of rails for the year to have been about 1,674,235 net tons.

PRODUCTS OF FORGES AND BLOOMARIES IN 1880.

As we have heretofore explained, blooms and billets from ore are made chiefly in the Champlain district of New York, and blooms from pig and scrap iron are made chiefly in Pennsylvania. The make of each product in the last eight years is given below, in net tons.

PRODUCTS.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Blooms and billets from ore	32,863	36,450	24,416	20,784	24,227	24,139	30,282	40,652
Blooms from pig and scrap iron	29,701	25,220	24,827	23,844	23,073	25,906	32,071	33,937
Total	62,564	61,670	49,243	44,628	47,300	50,045	62,353	74,589

The following table shows the proportion of ore blooms made in

the State of New York in the past six years, and the proportion of pig and scrap blooms made in the State of Pennsylvania in the same time, in net tons.

Years.	Ore Blooms made in New York.	Total make of Ore Blooms.	Pig and Scrap Blooms made in Penna.	Total make of Pig and Scrap Blooms.
1875	23,666	24,416	19,032	24,827
1876	20,202	20,784	13,401	23,844
1877	23,466	24,227	16,517	23,073
1878	22,829	24,129	15,121	25,906
1879	27,290	30,282	23,956	32,071
1880	34,351	40,652	24,319	33,937

The make of both kinds of blooms from 1865 to 1880 has been as follows.

Years.	Net tons.	Years.	Net tons.	Years.	Net tons.
1865	63,977	1871	63,600	1877	47,300
1866	73,555	1872	58,000	1878	50,045
1867	73,073	1873	62,564	1879	62,353
1868	75,200	1874	61,670	1880	74,589
1869	69,500	1875	49,243		
1870	62,259	1876	44,628		

THE IRON AND STEEL PRODUCTION OF ALLEGHENY COUNTY, PENNSYLVANIA.

The following table gives the production of iron and steel in Pittsburgh and the remainder of Allegheny county, Pennsylvania, in 1880 and the six preceding years, in net tons.

Years.	Number of Iron Rolling Mills.	Product of Iron Rails, Bar, Angle, Bolt, Rod, and Hoop.	Product of Sheet and Plate, except Nail Plate.	Product of Nails. Kegs of 100 pounds.	Total Rolled Iron, including Nails.
1874	31	194,114	52,361	562,995	274,625
1875	31	171,178	45,773	442 359	239,069
1876	31	189,511	31,488	538,874	247,943
1877	31	208,342	30,254	597,806	268,486
1878	31	226,687	33,445	444,013	282,333
1879	32	286,882	52,265	294,942	353,894
1880	30	287,253	80,899	419,098	389,107

Years.	Number of Blast Furnaces.	Make of Pig Iron.	Number of Steel Works.	Make of Crucible Steel Ingots.	Make of all other Steel, including Bessemer Ingots.	Total make of Steel.
1874	11	143,660	11*	17,915	6,000	23,915
1875	11	131,856	14*	22,942	15,498	38,440
1876	11	128,555	14*	25,009	54,467	79,476
1877	12	141,749	14*	24,747	82,401	107,148
1878	12	217,299	14*	27,866	106,948	134,814
1879	13	267,315	18*	40,142	130,781	170,923
1880	15	300,497	17*	52,136	169,819	221,955

* Bessemer steel included; four of these works are also iron rolling mills.

PRODUCTION OF LAKE SUPERIOR IRON ORE IN 1880.

From Mr. A. P. Swineford, editor of the Marquette *Mining Journal*, we obtain the statistics of the production of iron ore by the Lake Superior mines in 1880. The total product of the year was much the largest in the history of the district, being 1,987,598 gross tons, against 1,414,182 tons in 1879. The following table gives the details of the entire output of the Lake Superior district in 1880.

Name of Mine.	Gross tons.	Name of Mine.	Gross tons.
Barnum	24,522	Manganese	669
Bessemer	18,347	McComber	31,206
Boston	6,478	Michigamme	52,766
Breen	5,359	Milwaukee	13,142
Cambria	6,958	Mitchell	13,297
Champion	112,401	National	29,351
Chapin	34,556	New York	58,000
Cheshire	13,202	New York Hematite	2,192
Chicago	2,415	Norway	198,165
Cleveland	189,799	Pittsburgh & Lake Superior	38,881
Cleveland Hematite	22,949	Pendid	3,959
Columbia	6,663	Perkins	49,196
Commonwealth	9,643	Quinnesec	52,436
Cornell	30,741	Republic	235,387
Curry	21,851	Rolling Mill	15,172
Cyclops	14,368	Saginaw	35,059
Emmet	31,358	Salisbury	21,457
Florence	14,143	Section 12	330
Foster	1,122	Sterling	797
Goodrich	11,181	Stephenson	23,089
Humboldt	14,726	Taylor	1,110
Indiana	2,268	Vulcan	86,976
Jackson	120,620	Watson	3,104
Keel Ridge	11,496	Wheat	3,323
Keystone	10,217	Winthrop	45,247
Lake Angeline	14,928	Quartz-rock	8,066
Lake Superior	204,094		
Ludington	8,816	Total	1,987,598

Mr. Swineford estimates the value of the iron ore product of 1880 "in market" at $17,516,507.

The total production of iron ore and pig iron in the Lake Superior district since the beginning of its development is given by Mr. Swineford in the following table, in gross tons.

Years.	Ore.	Pig Iron.	Ore and Pig.	Years.	Ore.	Pig Iron.	Ore and Pig.
1856 and previous.	86,319	.....	86,319	1870	859,507	49,298	908,805
1857	25,646	.....	25,646	1871	813,984	51,225	865,209
1858	22,876	1,629	24,505	1872	948,533	61,195	1,009,748
1859	68,832	7,258	76,090	1873	1,195,234	70,507	1,265,741
1860	114,401	5,669	120,061	1874	935,488	86,494	1,021,982
1861	114,258	7,970	122,228	1875	910,840	81,753	992,593
1862	124,169	8,590	132,759	1876	993,311	61,911	1,055,222
1863	203,055	9,813	212,868	1877	1,025,129	29,685	1,054,814
1864	247,059	13,620	260,679	1878	1,125,093	17,404	1,142,497
1865	193,758	12,283	206,041	1879	1,414,182	39,583	1,453,765
1866	296,713	18,437	315,150	1880	1,987,598	48,523	2,036,121
1867	465,504	30,211	495,715				
1868	510,522	38,246	548,768	Total	15,321,128	790,298	16,111,426
1869	639,097	39,003	678,100				

The total value of the ore and pig iron shipped from the district down to the close of 1880 was $118,093,062.

The Menominee section of the Lake Superior district has a most surprising history. Since the beginning of shipments in 1877 the product of this section has been as follows, in gross tons.

1877	10,405
1878	94,245
1879	269,089
1880	592,193
Total	965,932

The product of 592,193 tons in 1880 was apportioned among the several mines as follows:

Name of Mine.	Gross tons.	Name of Mine.	Gross tons.
Breen	5,359	Ludington	8,816
Chapin	34,556	Norway	198,165
Cornell	30,741	Perkins	49,196
Commonwealth	9,643	Quinnesec	52,436
Curry	21,851	Stephenson	23,089
Cyclops	14,368	Vulcan	86,976
Emmet	31,358		
Florence	14,143	Total	592,193
Keel Ridge	11,496		

NEW JERSEY'S PRODUCTION OF IRON ORE IN 1880.

The report for 1880 of the geological survey of New Jersey has been politely sent to us by Professor George H. Cook, the State Geologist. From it we learn that the total quantity of iron ore shipped from the mines of New Jersey to local and other consumers during the year 1880 was 845,000 gross tons, being an increase of 356,972 tons, or 73 per cent. over the shipments of 1879, which amounted to 488,028 tons. Professor Cook says: "Iron mining began in Morris county as early as 1710, and was considered to be in a prosperous condition from that time onwards; but it did not reach an annual product of 100,000 tons till about 1855."

THE PRODUCTION OF ANTHRACITE COAL IN 1880.

The production of anthracite coal in 1879 was the largest in our history—26,142,689 gross tons. The production in 1880 was 2,705,447 tons less than that of 1879, being 23,437,242 tons. The decline in 1880 is due mainly to over-production in 1879. In 1881, however, there will be a large increase in production over 1880. During the first six months of the year the production amounted to 12,467,496

tons, which indicates a total production for the year of 25,000,000 tons. For these statistics, which are entirely reliable, we are indebted to Mr. John H. Jones, the accountant, who collects the statistics of anthracite coal by authority of the various transportation companies which connect with the anthracite coal region.

BITUMINOUS COAL STATISTICS FOR 1880.

We will have to wait until the coal statistics for the census year 1880 are published before we will know how much bituminous coal the country is annually producing. Our annual production of anthracite coal has been ascertained with great accuracy for many years. Mr. Frederick E. Saward estimates the bituminous coal production of the United States in 1880 at about 43,000,000 tons. Mr. Humphreys, the chief of the Bureau of Statistics of Pennsylvania, estimates the bituminous production of that State for 1880 at 17,169,358 tons, distributed as follows: First district, embracing the larger part of Allegheny, and the whole of Fayette, Westmoreland, Washington, Somerset, and Bedford, 12,158,248 tons; second district, embracing Mercer, Butler, Clarion, Armstrong, Beaver, Lawrence, Venango, Jefferson, and a portion of Allegheny, 2,318,880 tons; third district, comprising the counties of Tioga, Bradford, Lycoming, Clinton, Elk, Potter, McKean, Cameron, Clearfield, Centre, Huntingdon, Blair, and Cambria, 2,692,230 tons. Mr. Saward supposes the bituminous coal production of Ohio in 1880 to have been 7,000,000 tons, and that of Illinois to have been 4,000,000 tons.

In the following table we give, from official sources in the office of the Cumberland and Pennsylvania Railroad Company at Mount Savage, Maryland, the shipments of Cumberland coal from the commencement of the trade in 1842, in gross tons. The shipments in 1880 aggregated 2,136,160 tons.

Years.	Tons.	Years.	Tons.	Years.	Tons.	Years.	Tons.
1842...	1,708	1853...	533,979	1864...	657,996	1875...	2,342,773
1843...	10,082	1854...	659,681	1865...	903,495	1876...	1,835,081
1844...	14,899	1855...	662,272	1866...	1,079,331	1877...	1,571,339
1845...	24,653	1856 ..	706,450	1867...	1,193,822	1878...	1,679,322
1846...	29,795	1857...	582,486	1868...	1,330,443	1879...	1,730,769
1847...	52,940	1858...	649,656	1869...	1,882,669	1880...	2,136,160
1848...	79,571	1859...	724,354	1870...	1,717,075		
1849..	142,449	1860..	788,909	1871...	2,345,153	Total,	37,637,068
1850...	196,848	1861...	269,674	1872...	2,355,471		
1851...	257,679	1862...	317,631	1873...	2,674,101		
1852...	334,178	1863...	748,345	1874...	2,410 835		

In the following table we give the statistics of the total shipments

of coal and coke by the Monongahela Navigation Company from 1844, when the first shipments were made, to 1880. The shipments are given in bushels, each thousand bushels being the equivalent of 38 gross tons, which makes the weight of a bushel 85.12 pounds.

Years.	Bushels.	Years.	Bushels.	Years.	Bushels.	Years.	Bushels.
1844.....	737,150	1854.....	17,331,946	1864.....	35,070,917	1874.....	65,881,700
1845.....	4,605,185	1855.....	22,234,009	1865.....	39,522,792	1875.....	63,707,500
1846.....	7,778,911	1856.....	8,581,095	1866.....	42,605,300	1876.....	68,481,000
1847.....	9,615,127	1857.....	28,973,596	1867.....	30,072,700	1877.....	79,480,918
1848.....	9,819,361	1858.....	25,696,669	1868.....	45,301,000	1878.....	76,825,255
1849.....	9,708,507	1859.....	28,286,671	1869.....	52,512,600	1879.....	65,588,000
1850.....	12,297,967	1860.....	37,947,732	1870.....	57,596,400	1880.....	89,377,150
1851.....	12,521,228	1861.....	20,865,722	1871.....	48,621,300		
1852.....	14,636,841	1862.....	18,583,956	1872.....	57,280,500		
1853.....	15,716,367	1863.....	26,444,252	1873.....	58,276,995		

But little coke is shipped by the company, the coke product of Southwestern Pennsylvania being mainly made on the line of its various railroads. Of the 89,377,150 bushels shipped in 1880, only 5,328,800 bushels were coke.

UNITED STATES RAILWAY STATISTICS FROM 1830 TO 1880.

We are again indebted to Mr. H. V. Poor, the compiler of *Poor's Manual of the Railroads of the United States*, for statistical information concerning the growth of American railways. He informs us that 7,174 miles of new railway were constructed in this country in 1880, against 4,721 miles in 1879, 2,687 miles in 1878, 2,281 miles in 1877, and 2,712 miles in 1876. The increase of new railway in 1880 was 2,453 miles greater than the increase in 1879. The following is Mr. Poor's table of the railway mileage of the United States from 1830 to 1880, a period of fifty-one years.

Years.	Miles in Operat'n.	Annual Incr'se of Mileage.	Years.	Miles in Operat'n.	Annual Incr'se of Mileage.	Years.	Miles in Operat'n.	Annual Incr'se of Mileage.
1830.....	23	.....	1847.....	5,598	668	1864.....	33,908	738
1831.....	95	72	1848.....	5,996	398	1865.....	35,085	1,177
1832.....	229	134	1849.....	7,365	1,369	1866.....	36,801	1,716
1833.....	380	151	1850.....	9,021	1,656	1867.....	39,250	2,449
1834.....	633	253	1851.....	10,982	1,961	1868.....	42,229	2,979
1835.....	1,098	465	1852.....	12,908	1,926	1869.....	46,844	4,615
1836.....	1,273	175	1853.....	15,360	2,452	1870.....	52,914	6,070
1837.....	1,497	224	1854.....	16,720	1,360	1871.....	60,293	7,379
1838.....	1,913	416	1855.....	18,374	1,654	1872.....	66,171	5,878
1839.....	2,302	389	1856.....	22,016	3,642	1873.....	70,278	4,107
1840.....	2,818	516	1857.....	24,503	2,487	1874.....	72,383	2,105
1841.....	3,535	717	1858.....	26,968	2,465	1875.....	74,096	1,713
1842.....	4,026	491	1859.....	28,789	1,821	1876.....	76,808	2,712
1843.....	4,185	159	1860.....	30,635	1,846	1877.....	79,089	2,281
1844.....	4,377	192	1861.....	31,286	651	1878.....	81,776	2,687
1845.....	4,633	256	1862.....	32,120	834	1879.....	86,497	4,721
1846.....	4,930	297	1863.....	33,170	1,050	1880.....	93,671	7,174

The figures given in the above table denote the length of the railway lines in the country, without regard to the number of tracks or miles of sidings constructed. At the close of 1880 there were 93,671 miles of railway in the country. At the close of the present year 100,000 miles will have been reached and passed. Mr. Poor estimates that there are no less than 21,978 miles of railway in double, treble, and quadruple tracks, sidings, etc., which would make the total length of single track in the United States equal to 115,649 miles on the 1st of January, 1881. He has ascertained that up to the close of 1880 there were 33,680 miles of track laid with steel rails. This is about three-tenths of the total estimated mileage of single track.

The editors of the Chicago *Railway Age* have published a statement of the present condition of the narrow-gauge railways of the United States, from which we learn that up to the close of 1880 there had been built 6,629 miles of narrow-gauge railway in this country. Of this mileage, however, 645 miles had been widened to the standard gauge and 22 miles had been taken up, leaving in actual existence 5,962 miles of narrow-gauge railway at the time referred to. The total number of narrow-gauge railways in the United States is 149. In 1879 and 1880 the net gain in narrow-gauge railway construction was one railway and 1,774 miles of track, showing that the system is making progress.

The growth of the railway mileage of the leading geographical divisions of the country in the ten years from 1871 to 1880 is shown by Mr. Poor in the following table.

Divisions.	1871.	1880.
New England States	4,898	5,997
Middle States	12,030	15,949
Southern States	12,013	14,908
Western States	29,562	52,588
Pacific States	1,790	4,229
Grand total	60,293	93,671

In these ten years the railway mileage of the country increased 55 per cent. The Middle States embrace New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, and West Virginia. The other divisions need not be defined.

IRON SHIPBUILDING IN THE UNITED STATES FROM 1868 TO 1880.

The following table, compiled from the reports of the Hon. W. P. Titcomb, Assistant Register of the United States Treasury, shows

the number and tonnage of iron vessels built in the United States in each fiscal year since 1868, when their construction in this country was commenced.

Fiscal Years.	Sailing.		Steam.		Total.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
1868	.....	.....	.....	2,801	.....	2,801
1869	.....	1,039	.....	3,545	.....	4,584
1870	.....	679	.....	7,602	.....	8,281
1871	.....	2,067	20	13,412	.....	15,479
1872	.....	.....	20	12,766	20	12,766
1873	.....	.....	26	26,548	26	26,548
1874	.....	.....	23	33,097	23	33,097
1875	.....	.....	20	21,632	20	21,632
1876	.....	.....	25	21,346	25	21,346
1877	.....	.....	7	5,927	7	5,927
1878	.....	.....	32	26,960	32	26,960
1879	.....	.....	24	22,008	24	22,008
1880	1	44	30	25,538	31	25,582

The number and tonnage of iron vessels built in the fiscal year which ended on the 30th of June, 1881, can not yet be ascertained, but Mr. Titcomb has furnished us with the following statement of iron vessels built in the nine months from July 1, 1880, to March 31, 1881.

States and Districts.	No. of Vessels.	Tonnage.
New York, N. Y	1	158.32
Buffalo, N. Y	1	123.94
Philadelphia, Penna	15	11,558.23
Wilmington, Del	1	336.90
Baltimore, Md	1	437.80
Detroit, Mich	2	3,534.09
Total	21	16,129.28

Our iron shipbuilding industry makes no progress, although we can build and do build as good iron ships as are built in England or on the Clyde.

FOREIGN COMMERCE OF THE UNITED STATES SINCE 1861.

The following table, compiled from the reports of the Bureau of Statistics, shows the imports and exports of the United States in each fiscal year from 1861 to 1881. The phrases "net imports" and "domestic exports" indicate that all merchandise and specie imported and re-exported are excluded from the table. The table covers a period of twenty-one years, which almost exactly corresponds with the duration of our present Protective tariff era. The Morrill tariff, which succeeded the revenue tariff of 1857, became a

law on March 2d, 1861, when it received the signature of President Buchanan, and it took effect on the 1st of April of the same year.

Fiscal Years Ended June 30.	Net Imports. *Gold Value.*		Domestic Exports. *Gold Value.*	
	Merchandise.	Specie.	Merchandise.	Specie.
1861	$274,656,325	$40,348,401	$204,899,616	$23,799,870
1862	178,330,200	10,572,063	179,644,024	31,044,651
1863	225,375,280	1,421,056	186,003,912	55,993,562
1864	301,113,322	8,192,633	143,504,027	100,473,562
1865	209,656,525	6,784,970	136,940,248	64,618,124
1866	423,470,646	7,299,395	337,518,102	82,643,374
1867	381,041,764	16,178,299	279,786,809	54,976,196
1868	344,873,441	4,150,241	269,389,900	83,745,975
1869	406,555,379	5,585,462	275,166,697	42,915,966
1870	419,803,113	12,147,315	376,616,473	43,883,802
1871	505,802,414	7,231,395	428,398,908	84,403,359
1872	610,904,622	6,664,395	428,487,131	72,798,240
1873	624,689,727	10,777,909	505,033,439	73,905,546
1874	550,556,723	21,524,187	569,433,421	59,699,686
1875	518,846,825	12,625,704	499,284,100	83,857,129
1876	445,938,766	9,469,070	525,582,247	50,038,691
1877	438,518,130	27,746,915	589,670,224	43,134,738
1878	422,895,034	23,143,074	680,709,268	27,061,885
1879	433,679,124	12,853,594	698,340,790	17,555,035
1880	656,262,441	85,239,284	823,946,353	9,347,893
1881	624,141,851	105,335,594	883,868,105	14,226,944

Note.—The Canadian reports of imports into Canada from the United States indicate that in addition to the above "Domestic Exports" there were exported in the fiscal year 1874 merchandise of the value of $10,200,059; in 1875 merchandise of the value of $15,596,524; in 1876 merchandise of the value of $10,507,563; in 1877 merchandise of the value of $13,051,798; in 1878 merchandise of the value of $10,721,920; in 1879 merchandise of the value of $12,797,478; in 1880 merchandise of the value of $9,802,665.

The amounts just stated for the years 1874, 1879, and 1880 are gold values. Those for 1875, 1876, 1877, and 1878, however, are mixed or currency values. The average gold value of currency for each of those years was as follows: 1875, 88.8; 1876, 87.8; 1877, 92.7; 1878, 97.5.

In the fiscal year 1876 the balance of trade was turned in our favor, and it has since steadily remained in our favor and increased in volume from year to year.

The foreign trade of New York for the fiscal year which ended June 30, 1881, compares as follows with the previous year:

Imports and Exports.	1881.	1880.
Merchandise imports	$423,590,490	$411,486,131
Merchandise exports	406,858,861	392,741,064
Specie imports	110,329,471	83,358,731
Specie exports	11,002,183	8,053,955

IMMIGRATION INTO THE UNITED STATES FROM 1861 TO 1880.

During the year 1880 the number of persons of foreign birth who emigrated to the United States was 593,703; the number who arrived in 1879 was 250,565; the increase in 1880 over 1879 was therefore 343,138. The immigrants who are expected to arrive in 1881

will fully equal in number the arrivals in 1880. The largest immigration ever experienced prior to the present Old World exodus was in 1873, when it amounted to 422,545 persons. The total number of arrivals in the last twenty years has been 5,378,728.

Years.	Immigrants.	Years.	Immigrants.	Years.	Immigrants.
1861	89,720	1869	385,287	1877	130,526
1862	89,005	1870	356,303	1878	153,207
1863	174,523	1871	346 938	1879	250,565
1864	193,191	1872	437,750	1880	593,703
1865	248,394	1873	422,545		
1866	314,849	1874	260,814	Total	5,378,728
1867	293,601	1875	191,231		
1868	289,145	1876	157,440		

Of the total number of immigrants in 1880, Europe sent us 442,097; Asia, 7,098; Africa, 12; British North American Provinces, 139,761; West India Islands, 1,866; Mexico, 437; Central America, 42; South America, 119; Australia and Pacific Islands, 1,125; Azores, 682; Greenland and Iceland, 348; Bermudas and St. Helena, 32; born or picked up at sea, 84: total, 593,703. Of the immigrants from Great Britain, 84,799 came from Ireland; 64,190 from England; 14,495 from Scotland; 948 from Wales; not specified, 6: total, 164,438. Germany sent us 134,040; Sweden, 46,723; Norway, 23,054; Austria, 18,252; Italy, 12,756; Denmark, 8,778; Switzerland, 8,498; Hungary, 6,668; Russia, 5,278; France, 4,939; Netherlands, 3,730; Poland, 2,488; Belgium, 1,484; Spain, 420; Finland, 247; Portugal, 161; other European countries, 143. The Chinese immigrants numbered 7,011.

The statistics above given are for calendar years, and are collated from the reports of the Bureau of Statistics. Mr. Nimmo, the Chief of the Bureau, has published an advance statement of immigration into the United States during the fiscal year which ended June 30, 1881. He estimates that the total immigration during the year mentioned amounted to about 668,000 persons—a number not only unprecedented but astonishing in its magnitude. The immigration during the fiscal year which ended June 30, 1880, amounted to 457,257 persons. In the two fiscal years which ended on the 30th of June last over 1,100,000 immigrants arrived in the United States.

THE IMPORTATION OF STEEL BLOOMS IN 1880.

Hon. Joseph Nimmo, Jr., Chief of the Bureau of Statistics, just informs us that in the year which ended December 31, 1880, there were about 65,000 net tons of steel blooms imported into the United States. They were valued at $1,708,100.

GRAND SUMMARY OF UNITED STATES STATISTICS FOR 1880.

Production of Pig Iron in 1880, net tons	4,295,414
Production of Spiegeleisen in 1880, (included in Pig Iron,) net tons	19,603
Production of all Rolled Iron, including Nails and excluding Rails, in 1880, net tons	1,838,906
Production of Bessemer Steel Rails in 1880, net tons	954,460
Production of Open-hearth Steel Rails in 1880, net tons	13,615
Production of Iron and all other Rails in 1880, net tons	493,762
Total production of Rails in 1880, net tons	1,461,837
Production of Iron and Steel Street Rails in 1880, (included above,) net tons	16,894
Production of Cut Nails and Spikes in 1880, included in all Rolled Iron, kegs of 100 pounds	5,370,512
Production of Crucible Steel Ingots in 1880, net tons	72,424
Production of Open-hearth Steel Ingots in 1880, net tons	112,953
Production of Bessemer Steel Ingots in 1880, net tons	1,203,173
Production of Blister and "Patented" Steel in 1880, net tons	8,465
Production of all kinds of Steel in 1880, net tons	1,397,015
Production of Blooms from Ore and Pig Iron in 1880, net tons	74,589
Imports of Iron and Steel in 1880	$80,483,365
Exports of Iron and Steel in 1880	$12,960,995
Imports of Iron Ore in 1880, gross tons	493,408
Imports of Steel Blooms in 1880, net tons	65,000
Production of Lake Superior Iron Ore in 1880, gross tons	1,987,598
Shipments of Iron Ore in New Jersey in 1880, gross tons	845,000
Production of Anthracite Coal in 1880, gross tons	23,437,242
Production (estimated) of Bituminous Coal in 1880, gross tons	43,000,000
Miles of Railway Completed in 1880	7,174
Miles of Railway in the United States December 31, 1880	93,671
Miles of Railway Track in the United States December 31, 1880, (estimated)	115,649
Miles of Railway Track in the United States December 31, 1880, laid with Steel Rails (estimated)	33,680
Iron Ships Built in the United States in the fiscal year ended June 30, 1880	31
Imports of Foreign Merchandise into the United States in the fiscal year ended June 30, 1881	$642,593,219
Total Exports of Merchandise out of the United States in the fiscal year ended June 30, 1881	$902,319,473
Imports of Specie into the United States in the fiscal year ended June 30, 1881	$110,575,497
Total Exports of Specie out of the United States in the fiscal year ended June 30, 1881	$19,406,847
Immigrants into the United States in the calendar year 1880	593,703
Immigrants into the United States in the fiscal year ended June 30, 1881 (estimated)	668,000

PRODUCTION OF PIG IRON FROM 1872 TO 1880, BY STATES.

Collected from the manufacturers by The American Iron and Steel Association.

TOTAL PRODUCTION.

Make of Pig Iron in net tons.
(Tons of 2,000 pounds.)

STATES.	1872	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Maine	.....	780	1,661	2,046	3,002	1,960	1,190	1,240	3,578
Vermont	2,000	3,100	3,450	2,400	550	210	585	625	1,800
Massachusetts	17,070	21,136	27,991	21,255	5,040	2,904	1,426	5,404	19,017
Connecticut	22,700	26,977	14,518	10,880	10,160	14,443	15,880	16,759	22,583
New York	291,155	296,818	326,721	266,431	181,620	230,442	247,698	289,056	395,361
New Jersey	103,858	102,341	94,150	64,069	25,349	52,909	70,958	96,908	170,049
Pennsylvania	1,401,497	1,389,573	1,213,133	960,884	1,009,613	1,153,356	1,342,633	1,607,763	2,083,121
Maryland	63,031	55,986	54,556	38,741	19,876	26,959	24,027	37,257	61,437
Virginia	21,445	26,475	29,451	29,985	13,046	12,434	16,928	18,873	29,934
N'th Carolina	1,073	1,432	1,340	800	400	325	.....	.....	.....
Georgia	2,945	7,501	9,786	16,508	10,518	13,223	16,363	20,373	27,321
Alabama	12,512	22,283	32,863	25,108	24,732	41,241	41,482	49,841	77,190
Texas	619	280	1,012	.....	426	525	.....	400	2,500
West Virginia	20,796	23,056	30,134	25,277	41,165	34,905	50,667	70,801	70,338
Kentucky	67,396	69,889	61,227	48,339	34,686	47,607	50,182	48,725	57,708
Tennessee	42,454	43,134	48,770	28,311	24,585	25,940	28,347	41,475	70,873
Ohio	399,743	406,029	425,001	415,893	403,277	400,398	420,991	447,751	674,207
Indiana	39,221	32,486	13,732	22,081	14,547	15,460	.....	11,303	12,500
Illinois	78,627	55,796	37,946	49,762	54,168	61,358	78,455	78,143	150,556
Michigan	100,222	123,506	136,662	114,805	95,177	82,216	70,853	101,539	154,424
Wisconsin	65,036	74,148	50,792	62,130	51,261	22,205	49,887	89,522	96,842
Missouri	101,158	85,552	75,817	59,717	68,223	73,565	47,499	84,637	105,555
Oregon	.....	.....	2,500	1,000	1,750	.....	1,310	2,500	5,000
Minnesota	.....	.....	.....	.....	.....	.....	.....	.....	3,520
Utah	.....	.....	200	150	65	.....	.....	.....	.....
Total	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236	2,314,585	2,577,361	3,070,875	4,295,414

ANTHRACITE.

Massachusetts	4,250	5,432	10,214	11,140	.....	.....	.....	394	9,155
New York	271,343	267,489	298,428	254,935	173,535	213,879	231,936	220,927	367,517
New Jersey	103,858	102,341	90,150	64,069	25,349	52,909	70,958	96,908	170,049
Pennsylvania	968,153	913,085	775,008	554,992	588,829	658,521	783,731	939,569	1,237,930
Maryland	21,808	20,407	22,344	15,840	6,013	9,488	6,245	15,226	23,000
Virginia	.....	4,000	6,000	7,070	852	.....	.....	.....	.....
Total	1,369,812	1,312,754	1,202,144	908,046	794,578	934,797	1,092,870	1,273,024	1,807,651

BITUMINOUS COAL AND COKE.

Pennsylvania	388,011	430,634	397,147	371,401	397,685	465,199	529,542	632,299	801,817
Maryland	12,079	5,264	7,209	1,751	.....	77	.....	2,277	5,387
Virginia	.....	.....	.....	7,519	4,844	6,241	10,595	11,170	15,891
Georgia	.....	.....	5,516	12,685	10,018	9,194	13,860	16,246	20,044
Alabama	.....	.....	.....	.....	1,415	16,400	17,489	17,850	39,453
West Virginia	19,846	21,106	26,734	24,177	40,865	33,655	50,261	70,601	67,093
Kentucky	27,697	27,670	24,582	26,060	17,472	30,603	33,254	35,989	36,534
Tennessee	8,550	8,602	11,543	10,300	14,517	14,732	17,120	33,908	54,198
Ohio	304,121	305,531	332,166	353,922	354,346	358,281	387,478	404,306	605,017
Indiana	39,221	32,486	11,632	20,381	12,869	14,200	.....	11,303	10,500
Illinois	78,627	55,796	37,946	49,762	54,168	61,358	78,455	78,143	150,556
Michigan	13,382	9,551	7,693	13,000	12,700	7,000	.....	.....	.....
Wisconsin	37,246	35,268	21,819	36,656	25,000	.....	22,401	58,092	53,929
Missouri	55,569	46,016	26,724	19,931	14,110	45,005	30,638	66,800	89,786
Total	984,159	977,901	910,712	917,545	900,009	1,061,945	1,191,092	1,438,978	1,950,205

PRODUCTION OF PIG IRON FROM 1872 TO 1880, BY STATES.

(Continued.)

CHARCOAL.

Make of Pig Iron in net tons.
(Tons of 2,000 pounds.)

STATES.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Maine	.....	780	1,661	2,046	3,002	1,960	1,190	1,240	3,578
Vermont	2,000	3,100	3,450	2,400	550	210	585	625	1,800
Massachusetts	12,820	15,704	17,777	10,115	5,040	2,904	1,426	5,010	9,862
Connecticut	22,700	26,977	14,518	10,880	10,160	14,443	15,880	16,759	22,583
New York	19,812	29,329	28,293	11,496	8,685	16,563	15,762	18,129	27,844
Pennsylvania	45,033	45,854	40,978	34,491	23,099	29,636	29,360	35,895	43,374
Maryland	29,044	30,315	25,003	21,150	13,863	17,394	17,782	19,754	33,050
Virginia	21,445	22,475	23,451	15,396	7,350	6,193	6,333	7,703	14,043
N'th Carolina	1,073	1,432	1,349	800	400	325	.....	.....	.....
Georgia	2,945	7,501	4,270	3,823	500	4,029	2,503	4,133	7,277
Alabama	12,512	22,283	32,863	25,108	23,317	24,841	23,993	31,991	37,757
Texas	619	280	1,012	.....	426	525	.....	400	2,500
West Virginia	950	1,950	3,400	1,100	300	1,250	406	200	3,245
Kentucky	39,699	42,219	36,644	22,279	17,214	17,004	16,928	12,736	21,174
Tennessee	34,094	34,532	37,227	18,011	10,068	11,208	11,227	7,567	16,675
Ohio	95,622	100,498	92,835	61,971	48,931	42,117	33,513	43,445	69,190
Indiana	.....	.....	2,100	1,700	1,678	1,260	.....	.....	2,000
Michigan	86,840	113,975	128,969	101,805	82,477	75,216	70,853	101,539	154,424
Wisconsin	27,790	38,880	28,973	25,483	26,261	22,205	27,487	31,430	42,913
Missouri	45,589	39,536	49,093	39,786	24,113	28,560	16,861	17,837	15,769
Oregon	.....	.....	2,500	1,000	1,750	.....	1,310	2,509	5,000
Minnesota	.....	.....	.....	.....	.....	.....	.....	.....	3,520
Utah	.....	.....	200	150	65	.....	.....	.....	.....
Total	500,587	577,620	576,557	410,990	308,649	317,843	293,399	358,873	537,558

RECAPITULATION ACCORDING TO FUEL USED.

Anthracite	1,369,812	1,312,754	1,202,144	908,046	794,578	934,797	1,092,870	1,273,024	1,807,651
Charcoal	500,587	577,620	576,557	410,990	308,649	317,843	293,399	358,873	537,558
Bituminous	984,159	977,904	910,712	947,545	993,009	1,061,945	1,191,092	1,438,978	1,950,205
Total	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236	2,314,585	2,577,361	3,070,875	4,295,414

PRODUCTION OF PIG IRON IN CERTAIN DISTRICTS.

Pennsylvania.									
Lehigh Valley	449,663	389,969	316,789	280,360	261,274	335,059	416,907	456,350	544,987
Schuylkill Val.	232,225	236,409	232,420	123,184	144,969	155,434	144,558	194,748	306,926
Upper Susquehanna	127,260	129,304	88,243	71,731	79,217	56,776	84,547	125,971	168,128
Lower Susquehanna	159,305	157,403	137,556	79,717	103,369	111,252	137,719	165,500	217,889
Shenango Val.	160,188	160,831	156,419	137,025	138,495	145,179	122,958	150,861	215,313
Allegheny Co.	110,599	158,789	143,660	131,856	128,555	141,749	217,293	267,315	300,497
Miscellaneous coke	117,224	111,014	97,068	102,520	130,635	178,271	189,285	244,123	286,007
Charcoal	45,033	45,854	40,978	34,491	23,099	29,636	29,360	35,895	43,374
Ohio.									
Hanging Rock coke	23,169	28,601	26,015	36,899	44,269	44,544	31,137	43,097	60,316
Mahoning Val.	152,756	136,972	121,403	115,993	137,546	136,526	134,400	117,844	226,877
Hocking Val.	.....	.....	.....	1,250	7,483	23,895	65,690	54,908	85,719
Miscellaneous coke	128,196	139,958	184,748	199,780	165,057	153,316	156,254	161,457	232,105
Hanging Rock charcoal	87,440	92,365	85,873	57,413	42,822	40,212	33,513	43,445	64,854
Miscellaneous charcoal	8,182	8,133	6,962	4,558	6,109	1,905	.....	.....	1,336

STOCKS OF ALL KINDS OF PIG IRON, UNSOLD, DECEMBER 31, 1874, 1875, 1876, 1877, 1878, 1879, AND 1880.

These statistics, collected directly from the manufacturers by The American Iron and Steel Association, represent only stocks in the hands of makers or their agents. They do not include stocks in the hands of consumers or speculators, nor foreign iron in the hands of importers.

States and Districts.		Net tons.						
		1874.	1875.	1876.	1877.	1878.	1879.	1880.
New England and New York		138,224	121,507	101,624	101,873	87,171	6,604	63,549
New Jersey		37,959	26,095	1,742	4,877	11,645	3,144	20,780
Lehigh Valley	Pennsylvania.	28,791	50,878	47,000	34,082	45,678	10,171	48,306
Schuylkill Valley	Pennsylvania.	40,787	79,155	99,876	99,166	76,785	6,534	32,849
Upper Susquehanna	Pennsylvania.	12,868	13,980	29,566	4,289	5,480	3,742	4,375
Lower Susquehanna	Pennsylvania.	22,990	19,163	18,953	21,775	24,580	6,222	14,053
Shenango Valley	Pennsylvania.	87,650	35,097	27,443	25,389	11,926	800	26,582
Allegheny County	Pennsylvania.	12,250	4,920	4,000	6,470	10,080	2,000	3,553
Miscellaneous bituminous	Pennsylvania.	15,591	21,323	30,018	32,559	40,332	7,850	25,247
Charcoal	Pennsylvania.	21,533	22,392	14,843	14,163	13,876	3,166	9,273
Total for Pennsylvania		242,440	246,908	271,699	238,193	228,737	40,485	164,238
Maryland		15,958	13,767	6,317	4,933	6,986	961	9,028
Virginia, Georgia, Alabama, and Texas		39,042	34,070	32,430	23,558	19,552	3,541	16,428
West Virginia		8,971	3,400	3,457	2,050	5,207	308	5,271
Kentucky		32,992	27,590	18,489	16,145	20,892	6,715	16,215
Tennessee		27,766	19,559	13,376	15,798	10,756	7,257	11,643
Hanging Rock	Ohio.	69,747	71,405	59,234	63,081	50,205	24,803	33,697
Mahoning Valley	Ohio.	25,777	14,611	25,697	16,454	25,282	6,736	12,826
Miscellaneous	Ohio.	22,560	42,017	54,823	41,432	38,577	16,307	43,804
Total for Ohio		118,084	128,033	139,754	120,967	114,064	47,846	90,237
Michigan and Indiana		66,687	58,548	25,055	38,086	24,336	7,880	18,643
Illinois		7,229	5,816	4,746	7,792	.....	.....	25,134
Wisconsin and Minnesota		9,138	10,392	9,256	6,427	1,260	400	3,340
Missouri		51,294	61,769	58,613	61,632	40,732	16,483	12,152
Pacific States and Territories		.....	454	510	20	227	50	.....
Grand total		795,784	760,908	686,798	612,351	574,565	141,674	456,658

PRODUCTION OF IRON AND STEEL RAILS IN THE UNITED STATES IN THE TEN YEARS FROM 1871 TO 1880, BY STATES.

Statistics collected from the manufacturers by The American Iron and Steel Association.

States.	Net tons.										Per cent. of total production in 1880.	Per cent. increase on 1879.
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.		
Pennsylvania	335,604	349,113	328,522	259,288	255,136	353,925	347,968	406,266	498,333	670,198	46	34
Illinois	91,478	107,496	136,102	125,103	188,248	181,490	120,762	196,538	265,300	322,883	22	22
Ohio	75,782	138,165	130,326	82,561	91,775	100,799	82,270	87,520	109,386	133,187	9	22
New York	87,022	86,518	59,764	46,979	82,960	57,306	34,091	54,471	78,631	109,921	7	40
Indiana	12,778	23,893	26,579	20,617	23,309	29,283	31,876	28,660	30,879	41,523	3	34
Missouri	8,200	15,500	14,020	24,017	17,396	20,903	31,289	362	.....	35,746	2	.....
Wisconsin	28,774	37,284	39,495	29,680	28,403	21,280	21,439	28,000	30,890	30,207	2	Decrease.
Kansas	.....	.....	.....	2,000	5,000	14,707	16,018	12,685	10,208	29,085	2	185
Tennessee	9,667	14,620	13,973	13,693	12,250	21,391	11,373	9,179	15,185	18,552	1	22
Vermont	.....	.....	6,088	10,100	6,201	9,183	3,899	2,200	4,974	17,650	1	255
Kentucky	6,000	7,480	11,386	6,068	5,851	1,524	12,100	13,000	25,414	11,336		Decrease.
Massachusetts	28,864	29,242	34,034	24,765	18,391	9,061	9,610	7,995	7,725	9,672		25
Wyoming Territory	.....	.....	.....	.....	7,000	12,320	10,007	10,425	9,656	9,421		Decrease.
Maryland	41,911	30,533	42,356	48,008	30,619	18,814	8,531	3,200	2,393	6,887		188
California	.....	.....	475	7,016	8,073	8,629	5,750	6,779	6,936	4,722		Decrease.
Colorado	.....	.....	.....	.....	.....	.....	.....	1,600	2,500	4,500	Less than	80
West Virginia	5,000	20,100	4,000	522	406	538	1,756	1,230	3,277	2,155	1 per cent.	Decrease.
Georgia	7,810	6,930	8,275	8,061	6,500	9,000	10,031	8,345	11,259	485	each.	Decrease.
Alabama	.....	.....	.....	.....	.....	.....	.....	.....	.....	300		.....
Virginia	.....	.....	.....	.....	.....	.....	.....	.....	.....	107		.....
Maine	13,383	11,058	16,500	11,650	4,050	7,500	2,526	3,022	321	.....		.....
New Jersey	6,700	9,185	13,749	3,537	911	243	380	8	.....	.....		.....
Michigan	11,000	9,883	4,433	2,448	.....	1,600	.....	.....	.....	.....		.....
Total	775,733	1,000,000	890,077	729,413	792,512	879,629	764,709	882,685	1,113,273	1,461,837	.....	31

PRODUCTION OF ALL KINDS OF ROLLED IRON IN THE UNITED STATES FROM 1873 TO 1880.

Statistics collected from the manufacturers by The American Iron and Steel Association.

States.	Bar, Angle, Bolt, Rod, Hoop, Skelp, Plate, and Sheet Iron, including Nail Plate.—Net tons.								Iron Rails, all sizes.—Net tons.							
	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Maine	4,710	3,994	4,050	3,314	3,773	3,620	6,162	7,639	16,500	14,650	4,050	7,500	2,526	3,022	321	.....
New Hampshire	300	300	1,000	1,900	1,900	550	3,000	3,100	.....	.....	.....	.....	.....	.....	.....	.....
Vermont	.....	.....	.....	.....	.....	.....	.....	.....	6,088	10,400	6,201	9,183	3,899	700	3,300	1,650
Massachusetts	84,635	75,735	81,321	69,515	87,653	77,665	97,360	104,578	34,631	21,765	18,391	9,061	9,640	7,995	7,725	9,672
Rhode Island	11,662	10,616	9,584	7,394	7,500	8,000	9,800	7,632	.....	.....	.....	.....	.....	.....	.....	.....
Connecticut	11,409	11,921	9,618	10,144	7,298	10,138	13,486	16,046	.....	.....	.....	.....	.....	.....	.....	.....
New York	95,018	86,539	98,646	73,401	59,160	75,245	87,983	108,710	40,388	34,490	44,100	31,195	7,853	9,291	27,218	38,891
New Jersey	63,939	54,541	54,308	52,168	48,848	51,621	62,831	64,622	13,749	3,537	941	243	380	8	.....	.....
Pennsylvania	507,062	538,881	483,694	470,335	528,028	587,441	791,389	862,120	280,989	192,386	142,203	150,175	97,437	90,353	125,649	170,482
Delaware	11,617	11,818	15,252	17,598	18,249	14,127	26,923	29,806	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	15,669	20,883	16,068	12,337	12,702	7,375	22,925	34,045	42,356	48,008	30,619	18,844	8,531	3,200	2,393	6,887
District of Columbia	.....	.....	.....	.....	.....	82	230	276	.....	.....	.....	.....	.....	.....	.....	.....
Virginia	12,808	16,688	18,843	17,306	17,592	22,424	31,675	37,627	.....	.....	.....	.....	.....	.....	.....	107
Georgia	2,349	1,406	3,825	3,001	3,070	1,777	2,433	1,922	8,275	8,061	6,500	9,000	10,031	8,345	11,259	485
Alabama	500	1,000	1,000	1,000	700	500	1,000	6,304	.....	.....	.....	.....	.....	.....	.....	300
West Virginia	47,796	55,810	53,893	49,098	55,391	52,253	64,013	61,146	4,000	522	406	538	1,756	1,230	3,277	2,155
Kentucky	26,569	28,480	28,110	29,350	33,688	24,000	38,682	37,070	11,386	6,068	5,851	1,521	12,100	13,000	25,414	14,336
Tennessee	2,588	2,233	1,495	1,880	6,529	10,858	11,759	9,140	13,973	13,693	12,250	21,394	11,373	9,422	12,210	15,962
Ohio	141,740	137,809	145,816	148,529	161,978	169,042	196,019	257,737	106,094	65,288	63,804	60,649	46,131	34,180	42,906	50,829
Indiana	9,427	14,890	20,764	25,879	34,644	35,455	35,799	38,905	26,579	20,617	23,309	29,383	34,876	28,660	30,879	41,523
Illinois	6,915	8,990	12,428	9,931	15,292	33,044	45,295	48,154	98,228	76,823	77,059	47,777	31,243	52,753	67,419	61,275
Michigan	4,109	5,760	3,450	3,725	3,200	4,855	12,276	19,804	4,433	2,448	.....	1,600	.....	.....	.....	.....
Wisconsin	.....	275	14,437	8,700	11,820	16,400	30,443	34,683	39,495	29,680	28,403	21,280	21,439	28,900	30,890	30,207
Missouri	8,601	12,370	11,144	18,790	19,226	17,639	22,096	25,285	14,020	24,017	17,396	12,166	1,550	362	.....	1,273
Wyoming Territory	.....	.....	.....	.....	.....	.....	.....	400	.....	.....	7,000	12,320	10,007	10,425	9,656	9,421
Kansas	.....	.....	.....	.....	183	1,800	4,229	8,900	.....	2,000	5,000	14,707	16,018	12,685	10,208	29,085
California	6,915	9,205	6,121	6,836	5,792	6,472	9,016	10,555	475	7,016	8,073	8,629	5,750	6,779	6,936	4,722
Colorado	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,600	2,500	4,500
Nebraska	.....	.....	.....	.....	.....	.....	500	3,000	.....	.....	.....	.....	.....	.....	.....	.....
Total	1,076,368	1,110,147	1,097,867	1,042,101	1,144,219	1,232,686	1,627,324	1,838,906	761,062	584,469	501,649	467,168	332,540	322,890	420,160	493,762

PRODUCTION OF ROLLED IRON (EXCLUDING RAILS AND NAIL PLATE) IN THE UNITED STATES FROM 1873 TO 1880.

Statistics collected from the manufacturers by The American Iron and Steel Association.

States.	Bar, Angle, Bolt, Rod, Skelp, and Hoop Iron. Net tons.								Plate and Sheet Iron, not including Nail Plate. Net tons.							
	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Maine	4,710	3,994	3,700	3,311	3,773	3,620	6,162	7,639	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire	300	300	1,000	1,500	1,800	500	3,000	3,000	.....	.....	.....	400	100	50	.....	100
Massachusetts	44,490	40,324	40,336	35,857	46,731	42,019	55,118	48,323	8,822	6,592	13,395	11,326	13,105	11,803	20,730	29,640
Rhode Island	8,000	7,170	6,648	6,900	7,500	8,000	9,800	7,632	.....	.....	.....	.....	.....	.....	.....	.....
Connecticut	11,409	11,921	9,648	10,114	7,298	10,138	13,486	16,016	.....	.....	.....	.....	.....	.....	.....	.....
New York	85,908	76,590	90,583	66,323	53,831	72,422	87,478	106,274	4,888	4,000	1,000	3,498	1,522	500	.....	2,062
New Jersey	35,954	24,645	24,584	32,305	32,755	38,001	46,522	48,995	5,158	2,256	3,614	2,743	900	900	1,500	921
Pennsylvania	333,556	343,632	300,781	301,350	336,398	399,047	543,566	551,302	113,726	120,098	116,997	100,576	112,034	120,908	178,477	223,940
Delaware	8,274	6,860	9,316	14,168	11,250	8,648	17,427	19,300	3,343	4,958	5,936	6,430	6,999	5,779	9,496	10,506
Maryland	1,960	8,455	6,279	3,467	2,385	80	9,590	19,400	13,709	12,428	9,789	9,170	10,317	7,295	13,335	11,615
District of Columbia	.....	.....	.....	.....	.....	78	206	265	.....	.....	.....	.....	.....	4	21	11
Virginia	7,462	11,086	12,744	11,334	11,687	16,025	24,721	31,141	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	1,840	1,406	3,360	2,251	1,870	1,777	2,433	1,022	.....	.....	.....	.....	.....	.....	.....	.....
Alabama	500	1,000	1,000	1,000	700	500	1,000	6,301	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	2,863	1,609	1,805	1,701	3,123	3,746	4,518	4,638	1,000	.....	300	1,917	2,800	4,000	5,300	5,550
Kentucky	25,675	18,239	13,936	16,658	18,013	13,700	22,112	20,677	894	5,120	7,000	7,733	8,925	6,300	8,180	10,348
Tennessee	2,588	1,573	1,005	1,450	4,527	7,648	6,557	6,215	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	103,808	94,413	93,890	104,512	113,071	119,575	132,028	182,677	14,811	16,143	22,288	15,345	19,190	18,955	24,280	33,826
Indiana	4,500	7,376	14,465	13,664	18,957	19,762	19,739	17,808	.....	.....	.....	2,500	2,050	1,800	1,325	6,500
Illinois	5,240	2,500	6,000	9,921	8,941	22,133	30,203	33,647	.....	2,240	2,000	.....	.....	.....	.....	.....
Michigan	2,281	4,207	.....	1,900	1,550	3,455	8,526	12,539	1,825	1,553	3,450	1,825	1,650	1,400	3,750	7,265
Wisconsin	.....	275	11,137	8,700	11,820	16,400	30,443	31,683	.....	.....	.....	.....	.....	.....	.....	.....
Missouri	7,608	10,870	10,144	17,028	16,576	15,291	19,125	20,942	993	1,500	1,000	1,762	2,650	2,318	2,971	4,313
California	6,945	9,205	6,121	6,836	5,792	6,472	9,016	10,555	.....	.....	.....	.....	.....	.....	.....	.....
Kansas	.....	.....	.....	.....	183	1,800	4,229	8,900	.....	.....	.....	.....	.....	.....	.....	.....
Wyoming Territory	.....	.....	.....	.....	.....	.....	.....	400	.....	.....	.....	.....	.....	.....	.....	.....
Total	705,964	687,650	668,755	668,956	720,531	830,837	1,107,005	1,220,724	169,169	176,888	192,769	165,255	182,242	182,042	269,768	349,657

IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES DURING THE CALENDAR YEARS 1871 TO 1875.—GOLD VALUES.

Prepared from statistics furnished by the United States Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.	
	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.
Pig iron	245,535	$3,797,298	295,967	$7,269,850	154,708	$5,181,847	61,165	$1,738,438	83,962	$1,806,131
Castings	492	28,260	407	38,561	262	19,169	74	6,261	26	3,157
Bar iron	122,565	5,024,686	89,576	4,837,532	62,253	4,481,614	26,876	1,936,793	27,542	1,729,743
Boiler iron	322	27,351	684	59,993	464	44,324	53	7,627	51	7,272
Band, hoop, and scroll iron	13,103	594,166	12,365	748,509	8,245	537,140	1,422	91,385	255	13,596
Railroad bars or rails, of iron	566,202	19,132,359	381,064	14,498,012	99,201	4,708,189	7,796	393,589	1,174	67,857
Railroad bars or rails, of steel*	.....	.....	149,786	8,207,013	159,571	8,981,103	100,515	6,840,989	18,274	1,140,394
Sheet iron	12,047	857,895	15,149	1,263,112	10,713	1,090,486	6,741	1,017,988	4,050	631,174
Old and scrap iron	220,340	4,845,092	278,257	7,617,463	108,858	3,061 759	40,633	949,752	28,947	498,682
Anchors, cables, and chains	5,434	460,116	5,875	622,908	1,668	565,656	3,219	390,627	2,245	256,183
Hardware	.....	134,427	.....	325,208	.....	288,706	.....	303,728	.....	241,004
Machinery	.....	891,408	.....	1,148,713	.....	1,941,053	.....	797,512	.....	708,920
Fire-arms	.....	599,388	.....	811,872	.....	886,307	.....	692,005	.....	603,818
Steel ingots, bars, sheets, and wire	.....	3,460,735	.....	4,106,087	.....	3,865,316	.....	2,676,497	.....	2,152,303
Cutlery	.....	2,051,750	.....	2,272,467	.....	1,989,595	.....	1,453,570	.....	1,239,709
Files	.....	595,539	.....	676,814	.....	741,798	.....	430,688	.....	276,549
Saws and tools	.....	695,275	.....	476,927	.....	52,509	.....	32,669	.....	24,405
Tin plates	92,925	9,946,373	95,904	13,893,150	108,838	11,210,868	89,351	13,057,658	101,981	12,098,885
Other manufactures not specified	.....	4,724,181	.....	6,743,183	.....	7,322,099	.....	4,834,416	.....	3,863,019
Total	1,278,965	$57,866,299	1,325,034	$75,617,677	717,761	$60,005,538	337,845	$37,652,192	268,477	$27,363,101

* Previous to July 1, 1871, reported under head of iron rails. For six months ended December 31, 1871, $2,455,459 included with iron rails.

IMPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF INTO THE UNITED STATES FROM ALL COUNTRIES DURING THE CALENDAR YEARS 1876 TO 1880.—GOLD VALUES.

Prepared from statistics furnished by the United States Bureau of Statistics.

COMMODITIES.	1876.		1877.		1878.		1879.		1880.	
	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.	Net tons.	Values.
Pig iron	83,072	$1,795,365	66,861	$1,316,773	74,484	$1,519,990	340,672	$5,219,224	784,968	$14,998,212
Castings	35	3,028	53	4,741	69	7,170	61	3,779	115	6,806
Bar iron	26,653	1,532,361	30,531	1,477,224	33,346	1,515,598	48,840	1,780,736	126,986	5,721,828
Boiler iron	15	1,273	2	167	1	76	91	4,867	168	7,817
Band, hoop, and scroll iron	144	9,309	159	10,379	7	453	1,031	48,068	25,322	1,632,026
Railroad bars or rails, of iron	287	6,603	.....	.....	.....	.....	19,090	420,849	132,459	4,094,550
Railroad bars or rails, of steel	.....	.....	35	1,559	10	435	25,057	587,898	158,230	5,098,351
Sheet iron	1,758	211,260	1,184	115,618	858	92,586	5,459	514,430	11,412	943,669
Old and scrap iron	14,149	236,596	10,903	140,593	6,225	65,619	248,429	3,700,200	694,272	11,704,879
Anchors, cables, and chains	1,863	192,454	1,073	96,380	646	66,964	892	82,931	1,393	140,808
Hardware	.....	99,245	.....	111,490	.....	96,170	.....	145,356	.....	116,253
Machinery	.....	755,804	.....	654,268	.....	555,174	.....	715,314	.....	1,601,523
Fire-arms	.....	351,106	.....	304,933	.....	494,698	.....	635,515	.....	1,083,305
Steel ingots, bars, sheets, and wire	.....	1,522,892	.....	1,249,841	.....	1,135,781	.....	1,931,952	.....	5,583,363
Cutlery	.....	902,612	.....	1,063,836	.....	1,126,901	.....	1,360,630	.....	1,891,675
Files	.....	187,846	.....	117,539	.....	108,890	.....	105,581	.....	159,817
Saws and tools	.....	14,262	.....	14,513	.....	7,306	.....	5,959	.....	5,862
Tin plates	100,740	9,416,816	125,976	10,679,028	120,808	9,069,967	172,760	13,227,659	177,015	16,518,113
Other manufactures not specified	.....	2,777,771	.....	2,482,514	.....	2,149,226	.....	2,810,621	.....	6,771,508
Total	228,716	$20,016,603	236,777	$19,874,399	236,434	$18,013,010	862,382	$33,331,569	2,112,340	$80,483,365

DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE CALENDAR YEARS 1871 TO 1875.—CURRENCY VALUES.

Prepared from statistics furnished by the United States Bureau of Statistics.

COMMODITIES.	1871.		1872.		1873.		1874.		1875.	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
IRON, AND MANUFACTURES OF:										
Pig iron.....Net tons.	2,330	$67,481	1,477	$72,818	10,103	$444,349	16,039	$447,619	9,230	$250,919
Bar iron..... "	179	14,830	329	31,929	367	40,101	4,717	331,341	10,693	675,465
Boiler-plate iron..... "	24	3,517	33	5,041	125	14,519	122	13,219	74	6,272
Railroad bars or rails..... "	333	23,813	1,212	86,820	375	30,743	1,257	73,159	1,355	67,064
Sheet, band, and hoop..... "	30	3,518	165	13,781	49	7,108	86	12,284	89	8,481
Castings, not specified.....	.....	126,199	.....	144,653	.....	204,459	.....	271,276	.....	369,170
Car-wheels.....No.	4,043	82,467	4,873	97,060	12,274	196,438	6,644	137,589	7,397	120,688
Stoves, and parts of.....	.....	79,909	.....	101,359	.....	101,397	.....	141,953	.....	133,299
Steam-engines, locomotives.....No.	62	820,943	55	771,296	68	1,109,182	77	1,145,669	69	761,718
Steam-engines, stationary..... "	42	105,857	40	89,556	49	125,037	41	51,296	56	84,872
Boilers, separate from engines.....	.....	114,705	.....	166,554	.....	254,290	.....	95,604	.....	130,688
Machinery, not specified.....	.....	1,890,880	.....	3,160,538	.....	3,011,111	.....	4,153,278	.....	2,966,848
Nails and spikes.....Net tons.	2,355	245,289	2,682	322,879	3,409	371,663	5,139	481,010	5,484	434,743
All other manufactures of iron.....	.....	2,191,059	.....	2,737,588	.....	3,528,941	.....	3,279,704	.....	3,919,087
STEEL AND MANUFACTURES OF:										
Ingots, bars, sheets, and wire.....Net tons.	30	7,364	9	3,624	26	5,181	343	29,557	56	13,968
Cutlery.....	.....	90,064	.....	31,889	.....	54,409	.....	50,805	.....	30,318
Edge-tools.....	.....	532,395	.....	691,415	.....	862,096	.....	875,538	.....	671,123
Files and saws.....	.....	13,222	.....	14,536	.....	16,520	.....	28,173	.....	34,279
Muskets, pistols, rifles, and sporting-guns.....	.....	5,215,128	.....	1,165,424	.....	1,518,227	.....	3,613,430	.....	5,184,576
All other manufactures of steel.....	.....	207,197	.....	317,735	.....	236,265	.....	157,323	.....	229,328
Total exports of iron and steel.....	.....	$11,856,137	.....	$10,030,125	.....	$12,129,939	.....	$15,389,807	.....	$16,092,906
AGRICULTURAL IMPLEMENTS:										
Fanning-mills.....No.	36	$1,066	25	$689	120	$4,330	48	$1,379	146	$14,863
Horse-powers..... "	25	10,410	26	7,876	43	5,726	95	47,806	119	32,434
Mowers and reapers..... "	3,509	377,719	6,636	765,511	9,882	1,266,761	17,230	1,886,324	13,057	1,446,681
Plows and cultivators..... "	12,999	169,764	24,781	320,493	27,008	368,462	13,109	169,032	12,203	142,127
All others not specified.....	.....	461,861	.....	670,509	.....	868,703	.....	1,041,952	.....	804,697
SCALES AND BALANCES.....	.....	107,516	.....	173,423	.....	187,380	.....	134,996	.....	156,346
SEWING-MACHINES.....	.....	2,232,697	.....	2,376,873	.....	1,829,675	.....	1,770,951	.....	1,715,312
FIRE-ENGINES AND APPARATUS.....	.....	9,009	.....	15,118	.....	26,778	.....	16,185	.....	12,269
Total agricultural implements, fire-engines, etc.....	.....	$3,370,042	.....	$4,330,492	.....	$4,557,815	.....	$5,068,925	.....	$4,324,729

DOMESTIC EXPORTS OF IRON AND STEEL AND MANUFACTURES THEREOF FROM THE UNITED STATES TO ALL COUNTRIES DURING THE CALENDAR YEARS 1876 TO 1880.—CURRENCY VALUES.

Prepared from statistics furnished by the United States Bureau of Statistics.

COMMODITIES.	1876.		1877.		1878.		1879.		1880.	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
IRON, AND MANUFACTURES OF:										
Pig iron.....Net tons.	3,805	$94,314	7,682	$171,255	3,286	$81,206	1,282	$33,435	2,096	$70,496
Bar iron..... "	3,383	222,284	2,959	154,711	2,511	126,747	449	26,087	383	31,426
Boiler-plate iron.. ..... "	95	8,417	155	15,950	189	10,695	470	30,744	145	11,535
Railroad bars or rails..... "	3,562	153,465	7,145	281,198	9,108	289,710	2,055	76,957	1,006	40,671
Sheet, band, and hoop..... "	81	5,998	314	25,990	142	11,068	149	12,631	138	15,882
Castings, not specified.....	.....	243,155	.....	257,328	.....	251,227	.....	167,875	.....	211,682
Car-wheels.....No.	6,738	133,614	6,375	99,845	8,061	73,781	10,967	77,556	8,673	93,901
Stoves, and parts of.....	.....	119,263	.....	141,361	.....	98,837	.....	82,792	.....	120,781
Steam-engines, locomotives.....No.	43	534,907	64	633,501	82	785,716	91	730,830	73	651,686
Steam-engines, stationary..... "	52	75,412	83	62,720	94	127,076	105	99,295	98	130,431
Boilers, separate from engines.....	.....	70,879	.....	88,707	.....	122,744	.....	100,779	.....	84,707
Machinery, not specified.....	.....	2,556,121	.....	3,553,394	.....	3,616,915	.....	3,354,635	.....	3,685,205
Nails and spikes.....Net tons.	4,405	313,302	4,932	318,529	1,810	278,016	4,042	246,194	3,934	318,283
All other manufactures of iron.....	.....	3,299,683	.....	3,804,876	.....	4,222,989	.....	3,713,430	.....	4,651,409
STEEL AND MANUFACTURES OF:										
Ingots, bars, sheets, and wire.....Net tons.	85	17,051	72	16,101	81	13,444	41	8,510	148	35,568
Cutlery.....	.....	45,196	.....	42,086	.....	60,231	.....	74,823	.....	73,563
Edge-tools.....	.....	626,904	.....	908,211	.....	827,798	.....	868,716	.....	967,988
Files and saws.....	.....	36,535	.....	40,103	.....	38,271	.....	29,024	.....	31,877
Fire-arms.....	.....	3,055,513	.....	5,652,141	.....	1,825,279	.....	2,368,051	.....	1,370,149
Railroad bars or rails.....Net tons.	.....	.....	.....	.....	249	9,839	1,379	59,455	67	6,541
All other manufactures of steel.....	.....	185,846	.....	391,677	.....	388,747	.....	299,629	.....	351,214
Total exports of iron and steel.....	.....	$11,798,459	.....	$16,659,675	.....	$13,260,369	.....	$12,470,448	.....	$12,960,995
AGRICULTURAL IMPLEMENTS:										
Fanning mills.....No.	69	$1,656	255	$11,889	50	$7,787	3	$541	25	$797
Horse-powers..... "	29	12,154	63	22,689	55	21,639	38	16,516	8	1,005
Mowers and reapers..... "	12,027	1,223,214	8,016	808,154	10,659	1,044,427	9,118	876,510	6,862	811,965
Plows and cultivators..... "	15,260	132,230	19,654	160,595	18,360	134,828	20,876	155,882	22,633	189,908
All others not specified.....	.....	986,665	.....	994,622	.....	1,681,915	.....	1,473,195	.....	1,460,215
SCALES AND BALANCES.....	.....	146,971	.....	200,711	.....	184,611	.....	194,940	.....	293,024
SEWING-MACHINES.....	.....	1,659,377	.....	1,625,094	.....	1,638,873	.....	1,546,841	.....	1,896,149
FIRE-ENGINES AND APPARATUS.....	.....	42,957	.....	64,442	.....	18,043	.....	11,417	.....	6,535
Total agricultural implements, fire-engines, etc.....	.....	$1,205,224	.....	$3,888,196	.....	$4,732,126	.....	$4,275,842	.....	$4,659,598

IMPORTS INTO AND EXPORTS FROM THE UNITED STATES OF IRON AND STEEL AND MANUFACTURES THEREOF DURING THE FOUR MONTHS ENDED APRIL 30, 1881.

Prepared from statistics furnished by the United States Bureau of Statistics.

IMPORTS.

Commodities.	Net tons.	Values.
Pig iron	137,712	$2,232,296
Castings	55	3,554
Bar iron	6,043	291,933
Boiler iron	33	1,232
Band, hoop, and scroll iron	10	530
Railroad bars or rails, of iron	29,477	780,510
" " " steel	39,216	1,321,443
Sheet iron	858	53,610
Old and scrap iron	39,630	808,363
Anchors, cables, and chains	457	42,464
Hardware		18,872
Machinery		541,429
Fire-arms		295,216
Steel ingots, bars, sheets, and wire		2,270,530
Cutlery		651,961
Files		50,844
Saws and tools		7,974
Tin plates	67,057	4,867,722
Other manufactures not specified		1,504,500
Total	320,548	$15,814,983

DOMESTIC EXPORTS.

Commodities.	Quantities.	Values.
IRON, AND MANUFACTURES OF:		
Pig iron.....Net tons.	1,217	$31,982
Bar iron..... "	181	11,240
Boiler-plate iron..... "	45	3,384
Railroad bars or rails..... "	246	13,412
Sheet, band, and hoop..... "	25	2,003
Castings, not specified		92,887
Car-wheels.....No.	4,861	53,316
Stoves, and parts of		24,605
Steam-engines, locomotives.....No.	39	330,334
Steam-engines, stationary..... "	21	21,328
Boilers, separate from engines		39,709
Machinery, not specified		1,349,026
Nails and spikes.....Net tons.	1,306	88,915
All other manufactures of iron		1,706,922
STEEL, AND MANUFACTURES OF:		
Ingots, bars, sheets, and wire.....Net tons.	46	9,032
Cutlery		23,924
Edge-tools		332,362
Files and saws		18,245
Fire-arms		236,428
Railroad bars or rails.....Net tons.		
All other manufactures of steel		138,244
Total exports of iron and steel		$4,530,298
AGRICULTURAL IMPLEMENTS:		
Fanning mills.....No.	1	$31
Horse-powers..... "	2	450
Mowers and reapers..... "	4,014	363,099
Plows and cultivators..... "	6,968	61,798
All others not specified		661,116
SCALES AND BALANCES		47,127
SEWING-MACHINES		575,406
FIRE-ENGINES AND APPARATUS		4,326
Total agricultural implements, fire-engines, etc		$1,716,353

PRICES IN DOLLARS OF IRON RAILS, AT MILLS IN EASTERN PENNSYLVANIA, FROM 1847 TO 1881.—PER TON OF 2,240 LBS.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.	Average Price of Gold.
	$	$	$	$	$	$	$	$	$	$	$	$	$	
1847...	.....	71⅜	70⅞	70	70	70	69½	69½	67¼	67	67½	67½	.....	100
1848...	63	63	63	63	63	63	63	61¾	61¼	61	61	61	62¼	100
1849...	61	57½	53¾	53½	54¼	53½	53½	53¾	52	51½	51½	51½	53¾	100
1850...	47	47½	48	49	49	50	46	46¾	47½	48	48	48	47¾	100
1851...	43	45	47½	45	45	48	46	45¾	45	45	46	46¼	45⅝	100
1852...	46½	46¾	46½	46½	46½	46½	46½	46¾	47¾	49½	51	61	48⅜	100
1853...	74⅛	77½	77½	77½	77½	77½	77½	77½	77½	77½	77½	77½	77¼	100
1854...	81	81	81	81	81	81	81	81	81	81	77½	73⅛	80⅛	100
1855...	70	65	62½	62½	60	58¾	59½	59½	64½	65	65	63	62¾	100
1856...	62½	62½	63⅜	65	65	65	65	65	65	65	65	64	64⅜	100
1857...	65½	65½	64½	65¾	67	67	67	67	67	67	58½	50	64¼	100
1858...	50	50	50	50	50	50	50	50	50	50	50	50	50	100
1859...	49¾	49¼	49¼	50⅛	50¼	50¼	49¾	48¾	48¾	48¾	48¾	48¾	49⅜	100
1860...	48¾	48¾	48¾	48¾	48¾	48¾	48¾	46	47	47½	47½	46½	48	100
1861...	44	44	44	44	44	44	44	43⅛	43	41¾	36½	36½	42¾	100
1862...	36⅛	36⅛	41¼	41⅛	41⅛	41⅛	41⅛	41⅛	43	43¾	46	46	41¾	113
1863 ..	72½	69¾	72¼	73½	73½	78¾	81½	73¾	72¼	79½	87½	87½	76¾	145
1864...	91	101½	105	111	120	127½	141½	152½	153¾	140	133¾	132	126	202
1865...	125⅝	121¼	116¼	108½	90¼	84½	82½	86¼	90	92½	95	91	98¾	157
1866...	90	90	87¾	84⅜	84	85¾	86¾	87	87½	87½	85	85	86¾	140
1867...	85	85	84¼	82⅞	82½	82½	82½	82½	82½	82½	82½	82½	83½	138
1868...	81⅜	79	79	79	79	79	79	79	79	78¼	76	78¾	78⅝	140
1869...	76¼	76	76	76	76	76	76	80	78½	78½	78½	78½	77¼	136
1870...	74	72½	72½	72¼	72½	72½	72½	72½	72½	72½	70½	70	72¼	115
1871...	68¼	69	69	69½	71	71	71	71	71	71	71	71	70¾	112
1872...	71⅛	75⅝	84½	83¾	90½	90	89	87¾	88¾	88¾	88¾	85½	85¼	112
1873...	83⅓	83	83	82	80	78	76	75	75	70	68	66	76⅔	113
1874...	65	64	62	60	60	60	60	58	58	55	52	50	58¾	112
1875...	50	50	50	49	49	49	48½	47	46½	46	45½	43¾	47¾	114
1876...	43½	43	42½	42	42	41	41	41	40	40	39½	39	41¼	110
1877...	38	38	38	37½	37	34½	34½	34	33	32½	33	33	35¼	105
1878...	33½	33½	33½	33½	33½	33½	34	34	34	34	34	34	33¾	102
1879...	34	34½	35	35½	37½	38½	40	41	44	48	53	54	41¾	100
1880...	65	68	66	60	50	46¼	45	46	46	46	46½	45¼	49¼	100
1881....	46½	47½	47	47	46½	46½	46¾	.....	.....	.....	.....	.....	.....	100

PRICES IN DOLLARS OF BESSEMER STEEL RAILS, AT WORKS IN PENNSYLVANIA, FROM 1868 TO 1881.—PER TON OF 2,240 LBS.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.
	$	$	$	$	$	$	$	$	$	$	$	$	$
1868...	165	167½	174	172	165	162½	150	150	150	150	148	147½	158⅛
1869...	145	143¾	135	131	130¼	128	130	130	130	130¼	130¼	120	132¼
1870...	110	110	108¼	107	106	103¼	110	110	108¾	101½	102½	98	106¾
1871...	95	96	106	95	103	104	103¾	104	106	105¾	105¼	106½	102½
1872 ..	104½	104	104¼	111½	110	113	111½	115¼	114	113½	118	120¾	112
1873...	121	120	122½	120¼	120	121¾	121¾	121¾	118	120	120	120	120½
1874...	117½	117½	115	98⅜	98⅛	96¼	91	89¼	78¼	78¼	75⅔	75⅔	94⅞
1875...	71	71	71	69	69	69	69	69	69	67	66	65	68¾
1876...	67	65	62	62	62	60	59	59	56	54	53	52	59¾
1877...	49	49	49	49	47¼	46½	45¼	44¾	44	42¼	40½	40½	45½
1878...	41	41½	41½	42	43½	43	43½	42½	42½	42½	42	41	42¼
1879 ..	41	42	43	42½	42	43	44	48	50	55	61	67	48¼
1880...	75	85	82	75	65	63¾	62½	63¾	61¼	60	59	58	67½
1881....	60	62	62½	63	63	60	61	.....	.....	.....	.....	.....	.....

WHOLESALE STORE PRICES IN DOLLARS OF BEST REFINED ROLLED BAR IRON IN PHILADELPHIA, FROM 1844 TO 1881.

Compiled by The American Iron and Steel Association, from the sales books of several prominent Philadelphia iron merchants. Tons of 2,240 pounds.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
	$	$	$	$	$	$	$	$	$	$	$	$	$
1844...	90 00	90 00	90 00	90 00	90 00	82 50	82 50	82 50	82 50	82 50	82 50	82 50	85 62
1845...	82 50	87 50	92 50	100 00	100 00	100 00	95 00	92 50	92 50	92 50	95 00	95 00	93 75
1846...	95 00	95 00	90 00	92 50	92 50	92 50	95 00	92 50	90 00	90 00	90 00	85 00	91 66
1847...	85 00	85 00	85 00	85 00	85 00	90 00	90 00	85 00	87 50	85 00	85 00	85 00	86 04
1848...	85 00	85 00	85 00	85 00	85 00	80 00	80 00	80 00	75 00	75 00	67 50	70 00	79 33
1849...	70 00	70 00	70 00	70 00	70 00	70 00	65 00	65 00	65 00	65 00	65 00	65 00	67 50
1850...	65 00	65 00	65 00	62 50	60 00	57 50	57 50	57 50	57 50	56 00	56 00	55 00	59 54
1851...	55 00	55 00	55 00	55 00	55 00	55 00	55 00	55 00	54 00	54 00	54 00	54 00	54 66
1852...	54 00	54 00	52 50	52 50	52 50	52 50	52 50	55 00	60 00	70 00	70 00	80 00	58 79
1853...	90 00	90 00	90 00	87 50	85 00	80 00	80 00	77 50	77 50	80 00	80 00	85 00	83 50
1854...	90 00	90 00	90 00	90 00	90 00	92 50	95 00	95 00	95 00	92 50	90 00	90 00	91 33
1855...	82 50	80 00	75 00	72 50	70 00	70 00	70 00	72 50	72 50	75 00	77 50	77 50	74 58
1856...	75 00	77 50	77 50	77 50	75 00	72 50	70 00	70 00	72 50	72 50	72 50	72 50	73 75
1857...	72 50	72 50	72 50	72 50	72 50	72 50	70 00	70 00	70 00	70 00	70 00	67 50	71 04
1858...	65 00	65 00	65 00	62 50	62 50	65 00	62 50	60 00	60 00	60 00	60 00	60 00	62 29
1859...	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00
1860...	60 00	57 50	57 50	57 50	57 50	57 50	57 50	60 00	60 00	60 00	60 00	60 00	58 75
1861...	60 00	60 00	60 00	60 00	60 00	60 00	60 00	60 00	62 50	62 50	62 50	62 50	60 83
1862...	62 50	62 50	62 50	62 50	65 00	65 00	70 00	72 50	75 00	77 50	82 50	87 50	70 42
1863...	87 50	90 00	90 00	90 00	90 00	87 50	87 50	87 50	87 50	90 00	95 00	110 00	91 04
1864...	115 00	125 00	130 00	140 00	150 00	160 00	165 00	170 00	160 00	150 00	147 50	145 00	146 46
1865...	142 50	135 00	130 00	110 00	100 00	92 50	90 00	85 00	92 50	95 00	100 00	105 00	106 38
1866...	105 00	100 00	97 50	95 00	92 50	95 00	105 00	100 00	100 00	97 50	95 00	95 00	98 13
1867...	95 00	92 50	92 50	90 00	87 50	87 50	85 00	82 50	82 50	82 50	82 50	85 00	87 08
1868...	85 00	85 00	85 00	87 50	87 50	87 50	85 00	85 00	85 00	85 00	85 00	85 00	85 63
1869...	82 50	82 50	82 50	82 50	82 50	82 50	82 50	82 50	80 00	80 00	80 00	80 00	81 66
1870...	80 00	77 50	77 50	77 50	75 00	77 50	80 00	85 00	82 50	80 00	77 50	77 50	78 96
1871...	72 50	75 00	75 00	77 50	75 00	77 50	77 50	80 00	82 50	82 50	82 50	85 00	78 54
1872...	73 92	78 40	87 36	94 08	96 32	98 56	103 04	105 28	107 52	118 72	107 52	100 80	97 63
1873...	96 32	94 08	96 32	94 08	94 08	91 84	85 12	82 88	80 64	76 16	73 92	71 68	86 43
1874...	73 92	73 92	71 68	71 68	67 20	67 20	62 72	67 20	67 20	67 20	62 72	62 72	67 95
1875...	62 72	60 48	62 72	62 72	62 72	62 72	62 72	62 72	60 48	60 48	56 00	56 00	60 85
1876...	56 00	52 64	52 64	52 64	52 64	52 64	52 64	52 64	50 40	50 40	50 40	49 28	52 08
1877...	48 72	47 60	47 04	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	45 55
1878...	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	44 80	42 56	42 56	42 56	44 24
1879...	40 32	42 56	44 80	44 80	44 80	44 80	47 04	49 28	57 12	67 20	67 20	72 24	51 85
1880...	80 64	85 12	82 32	71 68	56 00	51 07	50 02	53 76	54 88	52 64	52 64	53 76	60 38
1881...	56 00	56 00	56 00	56 00	53 76	53 76	54 88	.....	.....	.....	.....	.....	.....

The highest price in any month in the above table was reached in August, 1864, $170; the lowest price in any month was in January, 1879, $40.32. The highest average price reached in any year was in 1864, $146.46; the lowest average price in any year was in 1878, $44.24.

PRICES IN DOLLARS OF No. 1 ANTHRACITE FOUNDRY PIG IRON IN PHILADELPHIA, FROM 1842 TO 1881.—PER TON OF 2,240 LBS.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.*	YEARS.
	$	$	$	$	$	$	$	$	$	$	$	$	$	
1842..	.....	.....	.....	.....	27	27	26½	24⅛	25⅛	25	25	25	.....	..1842
1844..	24	24	24	24	24	26⅛	26½	26⅝	27¼	28	27⅛	26¾	25¾	..1844
1845..	26¾	26½	27¾	33⅛	34⅛	33	31	28⅛	27	26⅞	28½	28	29¼	..1845
1846..	28	28	28¼	28	28⅛	28	29	26⅞	27⅛	27	28⅜	28⅛	27⅝	..1846
1847..	28½	28⅛	28⅝	29	29	28⅝	28	28½	30½	33¾	35¾	33¾	30¼	..1847
1818..	31	28⅛	27¼	26⅝	26⅛	26⅛	25⅜	25⅜	25⅛	25	25	24⅞	26½	..1848
1849..	25	24½	24⅜	24	‡23⅛	23	‡22¾	22½	‡21⅜	21½	20	21	‡22¾	..1849
1850..	21	21	20⅝	20⅞	20⅞	20⅛	20	20⅝	21	21	21	21¾	20⅞	..1850
1851..	21⅛	22	22	22	21⅜	21⅛	21	21	21	21	21	21	21⅜	..1851
1852..	21⅞	21⅛	20⅜	20⅜	20⅛	20½	20⅛	21⅛	23⅛	26⅛	27¾	28⅛	22⅝	..1852
1853..	32¾	36⅞	35⅝	35⅞	35⅞	36	36	36	36⅛	37⅝	37⅝	36⅜	36½	..1853
1854..	37	36⅛	37	38	38	38	38	38	37¾	36⅛	35½	32⅞	36⅞	..1854
1855..	31⅛	29½	27⅛	26¾	26⅛	26⅛	26⅛	26½	28	28⅝	28½	27¾	27¾	..1855
1856..	27½	27⅛	27⅝	28	28	27⅝	27	27	27	26⅞	26	26	27¼	..1856
1857..	26¼	26½	26⅝	27¾	27⅞	27¾	27⅛	26¾	26⅞	25¾	23½	23¾	26⅝	..1857
1858..	23½	22½	22½	22½	22½	22½	24⅜	24½	22	21½	21⅜	22½	22½	..1858
1859..	22⅝	23⅝	24½	23⅞	23½	23½	23	23½	22⅞	23½	23¼	23⅜	23⅜	..1859
1860..	23	23	23⅜	23⅛	23¼	23¾	23⅛	22½	22⅛	23¾	23¾	22½	23⅜	..1860
1861..	22⅛	21⅜	21¼	21⅞	21⅛	20½	19⅞	18⅜	18¾	18⅝	18⅞	19⅜	20¼	..1861
1862..	20	20⅜	20¼	21½	21⅜	22¾	24	24⅜	24½	25⅛	30½	31⅛	23⅞	..1862
1863..	32	33⅛	35½	36	34⅜	33½	32¾	31⅜	33	35¾	41⅜	43½	35¼	..1863
1864..	43⅛	48⅝	50⅛	54½	57¼	57⅝	60⅜	§73⅝	72¼	63¾	61½	59⅛	¶59¼	..1864
1865..	58½	53⅛	50½	45½	39⅛	35	35½	40½	44½	49⅞	51	50⅝	46½	..1865
1866..	50⅜	49	46½	41¾	41⅜	43⅞	46½	47¼	48½	48¾	49½	49½	46⅞	..1866
1867..	48¾	46½	44⅜	41	42¾	43	43⅜	44	44½	44½	43¾	42⅛	44⅛	..1867
1868..	38⅔	36¾	37⅞	38⅛	37	37	38⅛	39½	40⅞	41⅜	42⅞	43⅞	39⅛	..1868
1869..	42	40¼	41⅛	40	39⅛	40⅞	41⅝	41⅞	40¾	40½	39¾	39½	40⅝	..1869
1870..	36¼	34½	34⅛	33⅛	33⅛	32½	32¾	33½	33¼	32¼	31½	31¼	33¼	..1870
1871..	30½	30⅞	34¼	35⅜	35½	35	35¾	36	36½	36⅔	37¼	37⅛	35⅛	..1871
1872..	37	40¾	47	49½	49½	53⅜	51½	52¾	53⅞	53½	51¼	47⅝	48⅞	..1872
1873..	45⅛	48	48⅛	47¾	46	45	43¾	43½	42½	38	33	32½	42⅜	..1873
1874..	32	32	32	32	31½	31½	31½	31	29½	29	26¼	24	30¼	..1874
1875..	25⅞	26½	27	27	26	26	26	26	25	24	23¼	23½	25½	..1875
1876..	23¼	23	23	22¾	22	22	22	22	21¾	21¾	21½	21¼	22¼	..1876
1877..	20¾	20	20	19½	19	18¾	18¼	18	18¼	18½	18	18	18⅞	..1877
1878..	18½	18½	18⅛	18½	18	17¼	17¼	17½	17½	17	‡16½	17	¶17⅝	..1878
1879..	17¼	17½	17⅞	18	18½	18¾	19¼	20¾	24⅞	30	28	30½	21½	..1879
1880..	40	41	37½	31	25	23	23½	25	23¼	23	24½	25	28½	..1880
1881..	25	25½	26	25	25	24	24½	.....	.....	.....	.....	.....	.....	..1881

* Average for year to nearest *eighth*.

‡ Uncertain.

‡ Lowest average for month, $16½=November, 1878.

§ Highest average for month, $73⅝=August, 1864.

Lowest average for year, $17⅝=1878.

¶ Highest average for year, $59¼=1864.

☞ From 1842 to July, 1866, averaged monthly from weekly quotations in Philadelphia and New York prices current. From July, 1866, to 1881 averaged from weekly quotations in Bulletin of The American Iron and Steel Association.

THE ANTHRACITE COAL PRODUCTION OF PENNSYLVANIA.

Prepared from original and authentic statistics by John H. Jones.

YEARS.	THE WYOMING REGION.		THE LEHIGH REGION.		THE SCHUYLKILL REGION.		TOTAL.
	Gross tons.	Per cent.	Gross tons.	Per cent.	Gross tons.	Per cent.	
1820	.....	.....	365	.....	.....	.....	365
1821	.....	.....	1,073	.....	.....	.....	1,073
1822	.....	.....	2,240	60.21	1,480	39.79	3,720
1823	.....	.....	5,823	83.77	1,128	16.23	6,951
1824	.....	.....	9,541	85.90	1,567	14.10	11,108
1825	.....	.....	28,393	81.40	6,500	18.60	34,893
1826	.....	.....	31,280	65.10	16,767	34.90	48,047
1827	.....	.....	32,074	50.56	31,360	49.44	63,434
1828	.....	.....	30,232	39.00	47,284	61.00	77,516
1829	7,000	6.25	25,110	22.40	79,973	71.35	112,083
1830	43,000	24.60	41,750	23.90	89,984	51.50	174,734
1831	54,000	30.54	40,966	23.17	81,854	46.29	176,820
1832	84,000	23.12	70,000	19.27	209,271	57.61	363,271
1833	111,777	22.91	123,001	25.22	252,971	51.87	487,749
1834	43,700	11.60	106,244	28.21	226,692	60.19	376,636
1835	90,000	16.05	131,250	23.41	339,508	60.54	560,758
1836	103,861	15.18	148,211	21 66	432,045	63.16	684,117
1837	115,387	13.27	223,902	25.75	530,152	60.98	869,441
1838	78,207	10.59	213,615	28.92	446,875	60.49	738,697
1839	122,300	14.94	221,025	27.01	475,077	58.05	818,402
1840	148,470	17.18	225,313	26.07	490,596	56.75	864,379
1841	192,270	20.03	143,037	14.90	624,466	65.07	959,773
1842	252,599	22.79	272,540	24.59	583,273	52.62	1,108,412
1843	285,605	22.60	267,793	21.19	710,200	56.21	1,263,598
1844	365,911	22.43	377,002	23.12	887,937	54.45	1,630,850
1845	451,836	22.45	429,453	21.33	1,131,724	56.22	2,013,013
1846	518,389	22.11	517,116	22.07	1,308,500	55.82	2,344,005
1847	583,067	20.23	633,507	21.98	1,665,735	57.79	2,882,309
1848	685,196	22.18	670,321	21.70	1,733,721	56.12	3,089,238
1849	732,910	22.60	781,556	24 10	1,728,500	53.30	3,242,966
1850	827,823	24.64	690,456	20.56	1,840,620	54.80	3,358,899
1851	1,156,167	25.98	964,224	21.68	2,328,525	52.34	4,448,916
1852	1,284,500	25.72	1,072,136	21.47	2,636 835	52.81	4,993,471
1853	1,475,732	28.41	1,054,309	20.29	2,665,110	51.30	5,195,151
1854	1,603,478	26.73	1,207,186	20.13	3,191,670	53.14	6,002,334
1855	1,771,511	26 80	1,284,113	19.43	3.552,943	53.77	6,608,567
1856	1,972,581	28.47	1,351,970	19.52	3.602,999	52.01	6,927,550
1857	1,952,603	29.39	1,318,541	19.84	3,373,797	50.77	6,644,941
1858	2,186,094	31.96	1,380,030	20.18	3,273,245	47.86	6,839,369
1859	2,731,236	34.98	1,628,311	20.86	3,448,708	44.16	7,808,255
1860	2,941,817	34.56	1,821,674	21.40	3,749,632	44.04	8,513,123
1861	3,055,140	38.41	1,738,377	21.85	3,160,747	39.74	7,954,264
1862	3,145,770	39.97	1,351,054	17.17	3,372,583	42.86	7,869,407
1863	3,759,610	39.30	1,894,713	19.80	3,911,683	40.90	9,566,006
1864	3,960,836	38.92	2,054,669	20.19	4,161,970	40.89	10,177,475
1865	3,254,519	33.72	2,040,913	21.14	4,356,959	45.14	9,652,391
1866	4,736,616	37.29	2,179,364	17.15	5,787,902	45.56	12,703,882
1867	5,325,000	40.99	2,502,054	19.27	5,161,671	39.74	12,988,725
1868	5,968,146.	43.25	2,502,582	18.13	5,339,737	38.62	13,801,465
1869	6,141,369	44.28	1,949,673	14.06	5,775,138	41.66	13,866,180
1870	7,974,666	49.28	3,239,374	20.02	4,968,157	30.70	16,182,191
1871	6,911,242	44.02	2,235,707	14.24	6,552,772	41.74	15,699,721
1872	9,101,519	46.27	3,873,339	19.70	6,694,890	34.03	19,669,778
1873	10,309,755	48.57	3,705,596	17.46	7,212,601	33.97	21,227,952
1874	9,501,408	47.18	3,773,836	18.73	6,866,877	34.09	20,145,121
1875	10,596,155	53.75	2,834,605	14.38	6,281,712	31.87	19,712,472
1876	8,424,158	45.53	3,854,919	20.84	6,221,934	33.63	18,501,011
1877	8,300,377	39 85	4,332,760	20.80	8,195,042	39.35	20,828,179
1878	8,085,587	15.92	3,237,449	18.40	6,282,226	35.68	17,605,262
1879	12,586,293	48.14	4,595,567	17.58	8,960,829	34.28	26,142,689
1880	11,419,279	48.72	4,463,221	19.05	7,554,742	32.23	23,437,242

PRICES IN DOLLARS OF ANTHRACITE COAL FROM 1826 TO 1881.

Prices of Schuylkill White Ash Lump Coal, by the cargo, at Philadelphia. Averaged monthly from mean of weekly quotations. Per ton of 2,240 lbs.

Compiled by The American Iron and Steel Association.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average for year.
1826..	.....	.....	.....	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.50	7.80	.....
1827..	7.00	7.00	7.00	7.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
1829..	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.50	7.50	7.25	.....
1830..	7.25	7.25	6.00	5.75	5.75	5.75	5.75	5.75	5.75	5.75	.....	.....	.....
1833..	.....	.....	6.00	5.50	5.25	5.25	5.25	5.25	5.17½	4.87½	4.87½	4.87½	.....
1834..	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.87	4.50	4.84
1835..	4.56	4.56	4.56	4.56	4.60	4.63	4.63	4.68	4.88	4.90	5.03	6.47	4.84
1836..	7.70	7.44	7.31	6.58	5.38	5.50	5.50	6.19	6.41	6.50	7.13	8.05	6.64
1837..	8.25	8.25	8.04	6.78	6.50	6.38	6.10	6.00	6.00	6.09	6.13	6.13	6.72
1838..	6.13	5.91	5.28	5.25	5.16	5.13	5.13	5.13	5.10	5.00	5.00	5.00	5.27
1839..	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1840..	5.00	5.00	5.00	5.00	5.00	4.63	4.63	4.63	4.66	4.95	5.06	5.34	4.91
1841..	6.49	7.00	6.44	5.88	5.69	5.17	5.13	5.27	5.56	5.63	5.63	5.63	5.79
1842..	5.63	5.56	5.06	4.38	4.03	3.88	3.83	3.60	3.56	3.51	3.56	3.56	4.18
1843..	3.50	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.27
1844..	3.50	3.33	3.10	3.02	3.00	3.03	3.13	3.21	3.26	3.26	3.27	3.26	3.20
1845..	3.26	3.26	3.27	3.31	3.31	3.31	3.44	3.44	3.59	3.74	3.76	3.81	3.46
1846.	3.81	3.75	3.72	3.84	3.87	3.97	4.00	3.94	3.96	3.88	4.00	4.00	3.90
1847..	3.88	3.81	3.81	3.81	3.60	3.63	3.69	3.83	3.95	3.88	3.88	3.88	3.80
1848..	3.90	3.90	3.58	3.44	3.37	3.29	3.33	3.56	3.46	3.41	3.39	3.36	3.50
1849..	3.36	3.36	3.45	3.62	3.62	3.86	3.88	3.84	3.75	3.69	3.57	3.50	3.62
1850..	3.50	3.50	3.40	3.31	3.25	3.25	3.25	3.25	4.25	4.25	4.25	4.25	3.64
1851..	4.28	4.13	3.56	3.31	3.10	3.00	3.00	3.05	3.17	3.20	3.25	3.00	3.34
1852..	3.18	3.47	3.40	3.44	3.44	3.45	3.45	3.50	3.56	3.56	3.56	3.50	3.46
1853..	3.42	3.44	3.45	3.47	3.47	3.47	3.47	3.64	4.03	4.19	4.19	4.10	3.70
1854..	4.50	4.50	4.25	4.39	4.81	5.16	5.55	6.00	6.00	5.81	5.68	5.60	5.19
1855..	5.60	5.28	4.53	4.50	4.50	4.45	4.28	4.19	4.19	4.19	4.15	4.06	4.49
1856..	4.06	4.25	4.25	4.25	4.05	4.00	4.00	4.00	4.12	4.13	4.10	4.08	4.11
1857..	3.92	3.92	3.92	3.89	3.85	3.85	3.88	3.87	3.85	3.82	3.82	3.82	3.87
1858..	3.83	3.83	3.77	3.47	3.22	3.23	3.35	3.25	3.32	3.32	3.32	3.30	3.43
1859..	3.28	3.38	3.34	3.20	3.20	3.20	3.20	3.20	3.19	3.20	3.34	3.29	3.25
1860..	3.28	3.29	3.30	3.30	3.23	3.31	3.36	3.39	3.50	3.53	3.62	3.63	3.40
1861..	3.63	3.63	3.50	3.24	3.25	3.29	3.37	3.40	3.35	3.33	3.33	3.33	3.39
1862..	3.33	3.33	3.11	2.78	2.78	3.64	4.58	4.85	4.98	5.22	5.50	5.63	4.14
1863..	5.38	5.25	4.63	4.75	5.50	5.80	6.25	6.50	6.75	7.25	7.50	7.13	6.06
1864..	7.10	6.75	6.59	7.20	7.88	8.34	9.78	10.75	10.13	8.90	8.88	8.38	8.39
1865..	8.38	8.38	8.63	8.10	6.75	6.25	6.03	6.50	8.32	9.95	8.81	8.25	7.86
1866..	7.94	7.75	5.40	5.25	5.13	5.53	5.88	5.68	5.47	5.34	5.25	5.05	5.80
1867..	5.06	5.06	4.47	4.50	4.44	4.38	4.28	4.07	4.69	4.01	4.00	4.00	4.37
1868..	4.00	3.13	3.13	3.22	3.25	3.25	3.25	3.25	4.10	4.50	5.22	6.00	3.86
1869..	5.15	5.01	4.15	3.81	3.90	5.00	6.59	7.17	6.15	6.00	5.87	5.12	5.31
1870..	5.07	4.79	4.79	4.50	4.50	4.44	4.31	4.44	4.33	4.19	3.69	3.55	4.39
1871..	4.05	.....	.....	.....	.....	4.52	4.45	4.25	4.35	4.68	4.72	4.63	4.46
1872..	4.63	3.78	3.50	3.50	3.50	3.50	3.59	3.59	3.71	3.90	3.90	3.90	3.74
1873..	3.90	3.90	4.00	4.00	4.10	4.20	4.40	4.40	4.50	4.60	4.60	4.60	4.27
1874..	.....	.....	4.05	4.10	4.20	4.30	4.15	4.60	4.75	4.90	5.05	5.05	4.55
1875..	.....	.....	4.10	4.10	4.10	4.40	4.50	4.50	4.55	4.55	4.55	4.55	4.39
1876..	4.55	4.15	4.25	4.25	4.30	4.15	4.20	4.35	4.20	4.00	3.00	3.00	3.87
1877..	3.00	3.00	2.75	2.75	2.75	2.40	2.47	2.40	2.40	2.35	2.35	2.40	2.59
1878..	3.25	3.50	3.25	3.25	3.25	3.30	3.30	3.30	3.30	3.70	3.05	2.50	3.22
1879..	2.50	2.50	2.25	2.25	2.50	2.50	2.50	2.75	2.75	3.00	3.25	3.65	2.70
1880..	3.90	4.25	4.35	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.53
1881..	4.65	4.65	4.58	4.50	4.50	4.50	4.50	.....	.....	.....	.....	.....	.....

PRICES OF LEHIGH COAL IN PHILADELPHIA. (From Grotjan's *Public Side Report.*) 1822, May to December, $8.40. 1823, January to August, $10; September, $9.50; October to December, $8.40. 1824, January to April, $8.40.

PRODUCTION OF PIG IRON FROM 1854 TO 1880, CLASSIFIED ACCORDING TO THE FUEL USED.

Statistics collected from the manufacturers by The American Iron and Steel Association.

YEARS.	Anthracite. Net tons.	Charcoal. Net tons.	Bituminous. Net tons.	Total. Net tons.
1854	339,435	342,298	54,485	736,218
1855	381,866	339,922	62,390	784,178
1856	443,113	370,470	69,554	883,137
1857	390,385	330,321	77,451	798,157
1858	361,430	285,313	58,351	705,094
1859	471,745	284,041	84,841	840,627
1860	519,211	278,331	122,228	919,770
1861	409,229	195,278	127,037	731,544
1862	470,315	186,660	130,687	787,662
1863	577,638	212,005	157,961	947,604
1864	684,018	241,853	210,125	1,135,996
1865	479,558	262,342	189,682	931,582
1866	749,367	332,580	268,396	1,350,343
1867	798,638	344,341	318,647	1,461,626
1868	893,000	370,000	340,000	1,603,000
1869	971,150	392,150	553,341	1,916,641
1870	930,000	365,000	570,000	1,865,000
1871	956,608	385,000	570,000	1,911,608
1872	1,369,812	500,587	984,159	2,854,558
1873	1,312,754	577,620	977,904	2,868,278
1874	1,202,144	576,557	910,712	2,689,413
1875	908,046	410,990	947,545	2,266,581
1876	794,578	308,649	990,009	2,093,236
1877	934,797	317,843	1,061,945	2,314,585
1878	1,092,870	293,399	1,191,092	2,577,361
1879	1,273,024	358,873	1,438,978	3,070,875
1880	1,807,651	537,558	1,950,205	4,295,414

STATISTICS OF THE FOREIGN IRON TRADE IN 1880.

GENERAL SUMMARY FOR 1880 AND 1881.

THE condition of the foreign iron and steel industries since the latter part of the year 1879 has been one of general and continuous prosperity. Production and consumption have largely increased, and prices have been more favorable for producers than during the immediately preceding years. All of the iron-making world has experienced a prosperity akin to that which was restored to the iron and steel industries of our own country in 1879, and it is not saying too much to claim that the prosperity of these industries in other countries has been in large part due to the phenomenal demand created by the United States for their iron and steel products. A little more than a year ago agents were hunting in almost every European country for iron and steel rails, pig iron, old iron rails, old pots, and other scrap iron for shipment to the United States. So great was our iron hunger that even countries at the antipodes, which have no prominence in the manufacture of iron, contributed of their scanty supply of this article to relieve our distress. The imports of foreign pig iron at Boston during the third week of April, 1880, included 105 tons per bark *Elizabeth* from Australia, and in May of the same year about 400 tons of the rails of the first and thus far the only Chinese railroad, which had been torn up by the natives in 1877, were landed at New York from the ship *Tiber*, which sailed from Shanghai in the preceding month of March.

The American demand for both new and old iron and steel supplies has since declined, but the prosperity which this demand helped to create in the iron and steel industries of our European kin beyond sea still continues, although, as in this country, in a modified degree, and we are glad to chronicle the fact that it promises to continue for some time to come.

Without undertaking in this general statement to trace the course of the European iron trade during the year 1880 and the first half of the present year, it will be sufficient to note its condition at the present time.

The demand for British iron and steel products is not equal to the

immense capacity of its various iron and steel works, but it is still larger than it has been during many recent years, except in 1880, while prices are not nearly so low as they were two years ago. Steel especially is in demand, and it is probable that the steel production of this year will exceed that of last year. There is also special activity in the production of iron for iron ships, English and Scotch shipyards being very busy, and requiring large quantities of both iron and steel. The improved foreign demand within the past two years for British iron and steel products of all kinds is, of course, the main cause of the prosperity that the British iron and steel industries are now experiencing, but during these two years there has also been a partial revival of general industrial activity in Great Britain herself which has contributed to the prosperity of the particular industries mentioned. The only unsatisfactory feature of the British iron trade that now exists and is worthy of notice is the large accumulation of pig iron beyond the demands of the domestic and foreign markets; but England and Scotland had so largely exceeded in 1880 the production indicated by legitimate orders and ordinary British foresight as sufficient for the time that this accumulation, while productive of low prices, should not be permitted to obscure the fact that the sales of pig iron by Great Britain this year will be far beyond the average annual sales of the last ten years. Concerning the prices which Great Britain will this year receive for her pig iron, it does not appear that the producers of such iron as may be sold are in need of anybody's sympathy. *The Ironmonger*, it is true, sorrows as one without hope when it looks at the mountains of British pig iron which nobody wants at any price, but it lets a flood of light upon the situation when it admits that "we have made the iron now in hand more cheaply than at any period of our history." Great Britain is now reducing her production of pig iron by blowing out some of her furnaces, and the close of the year will probably see her stocks somewhat reduced and prices no lower than they are to-day. Prices for all iron products were firm in July.

On the Continent the activity of 1880 is well maintained. During the early part of the present summer there were some indications of a tendency to over-production and weakness in prices, especially in France and Germany, but in June the markets fully recovered the healthy tone which had previously characterized them. This favorable condition has since continued. Prices are low, as they now are in every important iron and steel producing country, but low prices may be borne if consumption is active and stocks are

not allowed to accumulate. A feeling of confidence now prevails, no signs of an unfavorable reaction being anywhere apparent. On the 15th of July the London *Iron* said: "The iron trade of the Continent is experiencing the full benefit of the large demand made upon it from all sides. A healthy tone has now become the permanent and universal feature of the Continental iron markets, and prices have an upward tendency."

The peace which is now general throughout Europe greatly promotes the prosperity of its iron and steel industries, as well as of all other industries which require stable conditions to secure their healthy development. To this favorable influence is added on the Continent another important influence which seems to be more marked at this time than at any previous time in European history—the spirit of industrial independence. A strong disposition to develop native manufacturing resources is observable in perhaps every Continental country except Turkey, and in none more conspicuously than in Spain and Italy, which have not heretofore been specially noted for industrial activity. Austria earnestly joins in this forward movement; Russia welcomes it, but her progress is impeded by many obstacles; Sweden, Holland, and Switzerland must see in it an improvement upon their own patient but not aggressive industrial methods; while France, Germany, and Belgium carry its flag and gather its substantial rewards more abundantly than their neighbors who have but recently felt its impulse. Railroads and machinery and the impressive example of the United States in developing all its resources are aiding the liberal spirit of the age to revolutionize Continental Europe, by giving industrial rather than military employment to its people. The manufacture of iron and steel is one of the industries of the Continent which is benefited by this peaceful revolution.

English newspapers note and uneasily comment upon the growing disposition of Continental countries to develop their own manufacturing resources, especially of iron and steel. *The Ironmonger* bewails its effect upon the iron and steel industries of Great Britain by remarking that "Germany needs very little of our pig iron, Belgium is only a moderate buyer, Russia excludes us under its new tariff, Austria-Hungary is self-supplying, Italy uses but small quantities, and France is nearly wholly self-supplying; Holland is a buyer on a small scale, as is Denmark; Sweden and Norway make better iron than we can provide for them." *Iron* more comprehensively declares that "the development of the iron trade on the Continent

during the last half century has made such enormous strides that it would have been strange indeed if it had not been felt also in this country. Not only have foreign makers succeeded in almost entirely replacing certain of our products by their manufactures in their respective countries, but they have entered markets which were formerly looked upon as entirely our own." The expansion and the competition of the Continental iron trade which are here so frankly confessed have been much more marked in the last decade than in any preceding decade.

Nations which insist on opening their own mines and developing all of their own resources, and which afford opportunities to their humblest people to obtain a proprietary interest in the soil, are not going backward but are going forward, and the hope may therefore be entertained that, with continued peace in Europe, the spirit of industrial independence which now prevails on the Continent will before long operate as a check to excessive emigration. We may be sure of one result—it will not in any naturally fertile and favored country create such a condition of privation and suffering among its inhabitants that the government of that country will be tempted to assist in its depopulation by offering a bounty to all who will expatriate themselves. Other countries may become as poor as Ireland, but not because the rulers of those countries insist upon upholding the right of their people to be employed at home in whatever honest labor their hands and their brains fit them to perform.

GREAT BRITAIN.

Great Britain's production of iron and steel and coal in 1880 was much the largest in her history. The official statistics of the production of pig iron and coal, by Mr. Robert Hunt, Keeper of Mining Records, upon which we always rely, have not yet appeared for 1880, but we are enabled from other sources to ascertain this production with substantial accuracy, and also the production of iron and steel generally in the same year.

According to the reports of the Inspectors of Mines, the total production of coal in Great Britain in 1880 was 146,969,409 tons. Mr. Hunt gives the production in 1879 as 134,008, 228 tons, so that the increase in 1880 was nominally 12,961,181 tons. This increase is without precedent, and is, of course, largely due to the recent extraordinary demand for fuel for blast furnaces and other iron works.

The annual production of coal in Great Britain first reached

100,000,000 tons in 1866, when it was 101,630,544 tons. The annual production in the last fifteen years has been as follows, the figures being Mr. Hunt's except for 1880:

Years.	Tons.	Years.	Tons.	Years.	Tons.
1866.....	101,630,544	1871.....	117,352,028	1876.....	133,344,766
1867.....	104,500,480	1872.....	123,497,316	1877.....	134,610,763
1868.....	103,141,157	1873.....	127,016,747	1878.....	132,607,866
1869.....	107,427,557	1874.....	125,043,257	1879.....	134,008,228
1870.....	110,431,192	1875.....	131,867,105	1880.....	146,969,409

The exports of coal from Great Britain to foreign countries in 1880 are reported to have amounted to 18,702,551 tons, which shows an increase of more than 2,000,000 tons over the exports of any preceding year.

We note here a remarkable verification of a prophecy made ten years ago concerning the production and consumption of coal in Great Britain in 1881. The *Colliery Guardian* stated a year or two ago that "when the Royal Commissioners of 1866 drew up their report in 1871 they estimated that in 1881 the total home consumption would be 128,000,000 tons; and that estimate, which does not include the quantity exported, will probably be realized." It came near being realized in 1880. The production in that year is stated to have been 146,969,409 tons, from which are to be deducted 18,702,551 tons shipped to foreign countries, leaving 128,266,858 for home consumption, which is slightly in excess of the estimate of the Royal Commissioners. But it may be claimed that the coal shipped for the use of British steamers engaged in foreign trade should also be deducted. Conceding this claim, as the quantity so shipped amounted last year to about 4,000,000 tons, it will be seen that the estimate fell short last year only that amount, and that it is very likely to be fully realized in 1881, the year for which it was made.

If the production of coal by Great Britain in 1880 surprises us, her production of pig iron in that year is even more surprising. Returns made by the makers to the British Iron Trade Association place it at 7,721,833 tons. Mr. Hunt gives the production in 1879 as 5,995,337 tons; the nominal increase in 1880 was, therefore, 1,726,496 tons—a quantity almost equal to the total production of the United States in 1876. Mr. Hunt's official returns of production in 1880 will doubtless vary somewhat from those made to the British Iron Trade Association, but the figures given by the Association may nevertheless be accepted as substantially accurate.

The annual production of pig iron in Great Britain first reached 5,000,000 tons in 1869, when it amounted to 5,445,757 tons. In 1870 the production increased to 5,963,515 tons. In the ten years since 1870 the annual production has been as follows, all the figures being official except for 1880.

Years.	Tons.	Years.	Tons.
1871	6,627,179	1876	6,555,997
1872	6,741,929	1877	6,608,664
1873	6,566,451	1878	6,381,051
1874	5,991,408	1879	5,995,337
1875	6,365,462	1880	7,721,833

The official statistics of the pig iron trade of Scotland and Cleveland furnish us with the following aggregate results in 1879 and 1880 in these two most important pig iron districts of Great Britain.

Districts.	Production—Tons.		Stocks 31st December—Tons.	
	1879.	1880.	1879.	1880.
Scotland	932,000	1,049,000	745,000	739,000
Cleveland	1,781,443	2,510,853	282,886	331,124
Total	2,713,443	3,559,853	1,027,886	1,070,124

The stocks of pig iron held in other districts of Great Britain at the close of 1880 are stated by Mr. Jeans, the Secretary of the British Iron Trade Association, to have been 471,287 tons, making a total of 1,541,411 tons. The total stocks at the close of 1879 were not ascertained, but they are estimated to have been about 60,000 tons less than at the close of 1880. Since the beginning of 1881 stocks of British pig iron are known to have increased about 200,000 tons, the total quantity of pig iron held in stock at the beginning of July being about 1,750,000 tons, which is fully a four-months' supply for Great Britain and all her customers, and is considerably in excess of the quantity usually on hand.

We are indebted to the editor of *Ryland's Iron Trade Circular* for the following summary of the condition of the blast furnaces of Great Britain on the 31st of December, 1880, and on the 31st of March and the 30th of June, 1881.

Total number of furnaces built in the United Kingdom, June 30, 1881	951
Total number of furnaces in blast in the United Kingdom, June 30, 1881	542
Decrease in the number in blast since March 31, 1881	33
Decrease in the number in blast since December 31, 1880	48

The decrease in the number of furnaces in blast since the 31st of December has been almost entirely in the Welsh and Midland districts, but the early blowing out of some Cleveland and Scotch furnaces is now probable.

The following table gives the highest and lowest prices of pig iron in Scotland and Cleveland during the past ten years.

Years.	No. 3 good mixed brands, free on board at Middlesbrough.				Scotch warrants, mixed numbers, at Glasgow.			
	Highest.			Lowest.	Highest.			Lowest.
	£	s.	d.	£ s. d.	£	s.	d.	£ s. d.
1871	3	2	6	2 6 0	3	10	0	2 11 6
1872	5	15	0	3 9 6	6	9	6	3 14 7
1873	6	2	6	4 3 6	6	17	9	5 5 9
1874	4	5	0	3 0 0	5	6	3	3 16 9
1875	3	0	0	2 8 0	3	14	6	2 19 1
1876	2	13	0	2 5 0	3	4	5	2 16 3
1877	2	6	6	2 0 0	2	17	3	2 12 1
1878	2	0	0	1 15 0	2	11	6	2 3 3
1879	2	12	6	1 12 6	3	8	0	2 0 0
1880	3	3	0	1 15 9	3	13	3	2 4 5

Passing from coal and pig iron to other British products in 1880, we find full details in the annual report for that year of Mr. J. S. Jeans, the Secretary of the British Iron Trade Association, which was issued on the 15th of March last. We take from this valuable report the following extracts, some of which we have condensed.

Iron Ore.—The most notable feature of the year 1880, so far as the course of the trade in iron ore is concerned, has been the very exceptional bulk of the importations from Spain and other countries. Within the last twelve years the importations of ore by the United Kingdom for ironmaking purposes have increased from 114,435 gross tons to 2,634,401 tons, or 2,200 per cent. Within the same period the make of pig iron in the United Kingdom has increased to the extent of 55 per cent. Evidently, therefore, the iron ore resources of our own country have not only quite failed to respond to the demands of the pig iron makers for the special qualities of ore employed for Bessemer purposes, but they have largely given place to the imported ores of which hematite ironmakers now so largely avail themselves. The importations of iron ore into the United Kingdom from all sources for the past three years have been as follows:

Years.	Gross tons.	Value.	Average price.
1878	1,173,860	£1,161,638	19.8s.
1879	1,083,692	1,037,719	20.7s.
1880	2,634,401	2,792,717	21.2s.

In 1880 the exports of iron ore from Great Britain were exceptionally large, reaching close on 100,000 gross tons. Of this quantity over 90,000 tons were shipped to the United States.

Manufactured Iron.—The production of manufactured iron in the United Kingdom during the year 1880 has been larger than for several previous years. In the Cleveland district it reached 508,434 gross tons; in South Wales it was about 255,000 tons; but the quantity made in the other districts could not be ascertained.

Bessemer Steel.—The production of Bessemer steel in the United Kingdom during 1880 reached a total of 1,044,382 gross tons, being an increase of 209,871 tons on the production of the previous year, which reached 834,511 tons. This increase, which is equal to 24 per cent., is the largest that has ever taken place in a single year. Of Bessemer steel rails the production during 1880 was 739,910 gross tons, being an increase of 213,192 tons, or 41 per cent., on the production of the previous year, which amounted to 519,718 tons. The following table shows what districts made Bessemer steel in 1880.

District.	Bessemer ingots—Gross tons.	Bessemer rails—Gross tons.
South Wales	398,233	258,404
Sheffield	273,365	151,174
Lancashire	167,870	116,431
Cumberland	140,869	114,696
Northeast Coast	144,000	92,559
Staffordshire	10,045	246
Total	1,044,382	739,910*

[* The correct footing of this table is 732,910.—J. M. S.]

The quantity of rails reported above for South Wales includes some open-hearth steel rails. The aggregate production of Bessemer steel in the United Kingdom for each of the last four years has been as follows:

Year.	Ingots—Gross tons.	Rails—Gross tons.
1877	750,000	508,400
1878	807,527	633,733
1879	834,511	519,718
1880	1,044,382	739,910

At the close of 1880 there were in Great Britain 106 Bessemer converters, of which 78 were at work and 28 were idle. Ten more were being built.

The total quantity of Bessemer steel plates made for shipbuilding and other purposes in 1880 has been 21,500 gross tons, being an increase of 12,349 tons, or 135 per cent., on the make of the previous year. Nearly one-half of this quantity was produced by one firm. Many firms engaged in the Bessemer steel trade are now also adopting the open-hearth process, by which something like 50,000 gross tons of ship-plates have been produced during the past year.

The prices of steel rails have varied very much during the past year. Commencing at about £6 per ton in January, they gradually rose until, in the second quarter of the year, they were selling at £9 10s. to £10 per ton; but from this point they receded almost as quickly, until in the middle of the third quarter the average price was about £7 10s., and in the last quarter about £6 was pretty evenly maintained throughout.

Open-hearth Steel.—The most notable advance yet made in the manufacture of open-hearth steel has been achieved during 1880. The total make of steel

by the Siemens process in that year has been 251,000 gross tons, being an increase of 76,000 tons, or 43.4 per cent. on the make of the previous year. The following table exhibits the production of open-hearth steel in the United Kingdom for the past eight years.

Years.	Gross tons.	Years.	Gross tons.
1873	77,500	1877	137,000
1874	90,500	1878	175,500
1875	88,000	1879	175,000
1876	128,000	1880	251,000

South Wales takes the first rank in the extent of the manufacture of open-hearth as in that of Bessemer steel, and now produces of both kinds about 430,000 tons per annum. The returns obtained of the quantities of rails, plates, angles, etc., made from open-hearth steel in 1880 are not sufficiently complete to allow of these being distinguished with precision. Such returns, however, as are to hand roughly show that quite one-third of the whole was converted into rails, while another third was manufactured into ship-plates. An addition of twenty-four has been made in 1880 to the number of open-hearth furnaces available for use in the United Kingdom, the totals being 102 at the end of 1879, and 126 at the end of 1880. Seventeen more furnaces are in course of erection.

Shipbuilding Statistics.—The year 1880 has not only witnessed the construction of a greater number and a larger tonnage of vessels than in 1879, but it has also seen the greatest progress ever made in any one year in the shipbuilding annals of the United Kingdom. It has, moreover, established its claim to be regarded as a point of departure whence the use of steel has made the greatest aggregate advance up to the present time. The total new tonnage launched last year in the United Kingdom was 735,849 gross tons, being an advance of 157,387 gross tons, or 27 per cent., on the tonnage launched in the previous year.

About four per cent. of the above ships were built of wood; therefore, about 700,000 gross tons of iron and steel ships were completed in 1880. The use of steel has been largely extended during the past year, but the exact amount of steel tonnage launched is not yet accurately ascertained. On the Clyde 42,688 tons of steel shipping were built, being an increase of 24,880 tons on the tonnage of 1879, or over 130 per cent.

There never, probably, was a period when the quantity of shipbuilding work on hand was greater than it is at the present time.

The total exports of all kinds of iron and steel from Great Britain in the ten years from 1871 to 1880 were as follows, in gross tons:

Years.	Tons.	Years.	Tons.
1871	3,169,219	1876	2,224,470
1872	3,382,762	1877	2,374,370
1873	2,957,813	1878	2,296,860
1874	2,487,162	1879	2,883,484
1875	2,458,306	1880	3,787,271

The destination of the above exports during the last five years is given in the following table.

Countries.	1876.	1877.	1878.	1879.	1880.
	Tons.	Tons.	Tons.	Tons.	Tons.
United States	158,824	167,870	157,173	717,986	1,355,582
British North America	131,990	119,488	102,783	144,214	208,611
India	158,093	229,250	210,888	195 387	290,771
Australia	122,073	216,066	205,388	167,784	210,422
British South Africa	8,406	10,625	9,246	22,628	22,319
Russia	132,538	100,885	86,253	211,680	204,107
Germany	298,416	284,392	289,658	259,537	269,728
Holland	267,891	224,953	259,617	239,768	210,382
Belgium	115,418	98,946	90,544	83,750	116,628
France	112,319	123,186	112,587	101,370	117,170
Italy	53,971	44,590	47,963	62,603	52,775
Turkey	9,923	7,552	11,044	12,756	6,957
Sweden and Norway	11,252	61,856	23,692	14,320	7,087
Denmark	6,291	3,635	5,044	5,048	205
Spain and Canaries	31,860	32,245	38,336	27,546	26,889
Egypt	582	1,002	2,914	2,957	3,968
Brazil	33,803	58,828	51,869	63,910	37,088
Peru	3,976	2,719	4,912	5,082	1,689
Chili	3,269	999	1,411	802	5,256
Destination not specified	533,575	585,283	585,538	544,356	639,637
Total	2,224,470	2,374,370	2,296,860	2,883,484	3,787,271

The exports of pig iron to all countries during the ten years from 1871 to 1880 were as follows:

Years.	Tons.	Years.	Tons.
1871	1,057,458	1876	910,705
1872	1,331,143	1877	882,059
1873	1,142,065	1878	923,080
1874	774,280	1879	1,223,436
1875	947,827	1880	1,631,629

The destination of the exports of pig iron during the last five years is given in the following table.

Countries.	1876.	1877.	1878.	1879.	1880.
	Tons.	Tons.	Tons.	Tons.	Tons.
Belgium	115,193	98,824	90,318	83,750	116,628
Russia			85,509	146,830	152,966
Germany	245,742	233,554	228,434	233,900	247,874
Holland (in part for Germany)	235,265	201,731	240,969	213,386	190,026
France	95,132	107,800	96,363	85,520	99,036
United States	41,640	35,953	32,663	277,939	612,013
British North America	24,431	21,277	23,423	29,820	54,748
Other countries	153,302	182,920	125,401	152,291	158,338
Total	910,705	882,059	923,080	1,223,436	1,631,629

The exports of railway iron and steel to all countries during the ten years from 1871 to 1880 were as follows:

Years.	Tons.	Years.	Tons.
1871	981,197	1876	414,656
1872	945,420	1877	498,256
1873	872,579	1878	450,346
1874	782,665	1879	463,878
1875	547,565	1880	694,019

The destination of the exports of railway iron and steel during the last five years is given in the following table.

Countries.	1876.	1877.	1878.	1879.	1880.
	Tons.	Tons.	Tons.	Tons.	Tons.
United States	374	2,525	922	44,919	220,893
Russia	86,183	84,548	59,886	38,632	10,000
Turkey	426	309	501	1,024	66
British India	51,267	105,825	104,219	87,482	137,795
British North America	61,095	36,318	33,869	64,433	86,304
Egypt	582	1,092	2,908	2,957	3,968
Australia	20,582	84,783	75,324	56,500	85,977
Brazil	22,398	24,166	15,449	31,857	18,139
Holland	692	952	118	7,653	2,193
Spain and Canaries	19,548	20,569	26,576	14,515	12,999
Sweden and Norway	41,252	61,856	23,694	14,320	7,087
Chili	3,269	999	1,404	802	5,256
Denmark	6,291	3,635	5,062	5,048	205
Peru	2,656	1,308	3,540	2,966	1,180
France	138	155	120	*	*
Germany	14,171	23,459	37,004	3,507	577
Belgium	225	122	221	*	*
Italy	18,811	9,799	19,084	36,784	25,504
British Possessions in South Africa	*	*	8,962	5,900	8,892
Other countries	55,696	35,926	31,480	44,579	66,984
Total	414,656	498,256	450,346	463,878	694,019

* Included during this year in "other countries."

The following table shows the exports of pig iron, railway iron and steel, and all other kinds of iron and steel from Great Britain to the United States in the ten years from 1871 to 1880.

Years.	Pig Iron.	Railway Iron and Steel.	Other Iron and Steel.	Total.
	Tons.	Tons.	Tons.	Tons.
1871	190,183	512,277	224,555	927,015
1872	195,151	467,304	307,932	970,387
1873	102,624	185,702	200,240	488,566
1874	42,868	94,491	146,463	283,822
1875	51,362	17,789	136,963	206,114
1876	41,640	374	116,810	158,824
1877	35,953	2,525	129,392	167,870
1878	32,663	922	123,588	157,173
1879	277,939	44,919	395,128	717,986
1880	612,013	220,893	522,676	1,355,582
Total	1,582,396	1,547,196	2,303,747	5,433,339

The following table shows the exports of iron and steel from Great Britain to all countries in the first six months of 1881, compared with the total exports of iron and steel in the first six months of 1880.

COUNTRIES.	First six months of 1881—Gross tons. Pig iron	Bar, angle, bolt, and rod iron.	Railway iron and steel.	Hoops, sheets, and plates.	Other iron and steel products.	Total.	First six months of 1880. Gross tons.
United States	177,294	6,271	159,309	11,940	177,463	532,277	980,267
British North America	16,162	15,987	45,546	4,729	12,477	95,141	104,590
India	.....	27,297	48,301	17,996	26,627	120,221	149,228
Australia	.....	13,532	41,587	25,059	33,630	113,808	107,404
British South Africa	.....	.....	1,539	.....	6,265	7,804	11,883
Russia	35,964	1,016	6,902	5,235	3,862	52,979	62,138
Germany	106,595	3,312	66	7,373	4,174	121,550	110,818
Holland	102,776	1,443	161	2,603	3,977	110,960	92,539
Belgium	44,450	.....	.....	.....	.....	44,450	79,263
France	77,530	461	.....	2,495	8,793	89,279	56,650
Italy	.....	10,432	13,498	7,377	.....	31,307	18,906
Turkey	.....	4,658	4,372	.....	.....	9,030	3,142
Sweden and Norway	.....	.....	1,605	.....	.....	1,605	1,208
Denmark	.....	.....	93	.....	.....	93	45
Spain and Canaries	.....	.....	5,669	3,223	4,324	13,216	11,520
Egypt	.....	.....	3,706	.....	.....	3,706	3,705
Brazil	.....	.....	23,598	.....	10,749	34,347	20,493
Peru	.....	.....	595	.....	210	805	1,007
Chili	.....	.....	418	.....	.....	418	428
Not specified	98,563	48,899	32,625	44,453	120,671	345,211	279,761
Total	659,574	133,338	389,590	132,483	413,222	1,728,207	2,094,995

In January last *The Ironmonger*, in referring to the manufacture of Bessemer steel rails, stated an important fact in the following language: "A year ago the total output capacity of steel rails in England was rather more, and in America rather less, than 750,000 tons per annum, while now, with the works already in operation or ready to commence at short notice, the total in each country is about 1,000,000 tons. The great increase in the manufacturing capacity both of Europe and America has alone prevented that return to high prices which the present demand would have caused; and as, on both sides the Atlantic, factories are being still further extended, the same counteracting cause will have effect for some time to come." This is a handsome tribute to our Protective tariff policy, and to the Protective tariff policy of France, Germany, Austria, and Russia.

The basic dephosphorizing process for the manufacture of Bessemer steel has been successfully adopted in nearly all the steel-making countries of Europe. In England there are now 4 basic Bessemer converters, in Belgium 4 and 4 others projected, in Germany 14, in Austria 5 and 2 others projected, in Russia 2, and in France 3. In the last-named country the basic process has also been applied with good results to 2 Siemens-Martin furnaces.

This record shows remarkable progress in the adoption of a revolutionary process which is not yet four years old. The first patent of Mr. Sidney Gilchrist Thomas, the principal inventor of this successful method of dephosphorizing iron, is dated November 22, 1877, and relates to the application of a basic lining to Bessemer converters. Mr. Thomas is a resident of London, his address being No. 27 Tedworth Square, Chelsea. His associate in the perfection of the invention, Mr. Percy C. Gilchrist, is also a resident of London. A year and a half ago the success of the Thomas and Gilchrist process was not assured; now it is in successful use in six of the leading countries of Europe. England thus adds another to the list of her important inventions affecting the manufacture of iron and steel.

GERMANY.

The iron and steel and coal industries of Germany are the most important of their class on the Continent, but their statistics are not so promptly compiled and given to the public as are like statistics for Great Britain, France, and Belgium. The record for 1880 is yet to be made up.

Herr J. Schlink, of the Friedrich-Wilhelmshütte, in Mülheim, Ruhr, has compiled the statistics of the production of pig iron in Germany in 1879, and other information bearing upon this branch of the German iron industry for that year, which is summarized as follows: "The German Zollverein, *i. e.*, the German Empire, including the Grand Duchy of Luxemburg, produced in 1879: Foundry pig iron, 128,653 tons; Bessemer pig iron, 465,600 tons; forge pig iron, 1,508,688 tons; castings of first smelting, 22,200 tons; scrap pig iron, 8,867 tons; total, 2,134,008 tons; and imported 392,318 tons; exported, 428,000 tons. The imports consist chiefly of Scotch and Cleveland foundry pig and of Cumberland Bessemer pig iron. The German pig iron industry embraces three large districts: the Rhenish-Westphalian, the Luxemburg-Lorraine, and the Upper Silesian district. The Rhenish-Westphalian blast furnaces produce ferro-manganese, spiegeleisen, and manganiferous puddling iron, Bessemer and foundry pig iron, but not much ordinary white forge pig iron."

The Association of German Iron and Steel Manufacturers gives the following statistics of the production of other iron products in Germany in 1879, in metric tons: Finished iron, 1,150,023 tons; blooms, in addition to the foregoing, 65,466 tons; finished steel, 478,344 tons; additional steel blooms, 15,038 tons.

The most complete statistics of the German iron industry accessible are for 1878, and are contained in the excellent paper of Dr. Hermann Wedding, of Berlin, read at the Dusseldorf meeting of the Iron and Steel Institute of Great Britain in the summer of 1880. We condense some of the leading facts contained in it as follows:

The production of pig iron in Germany and the Grand Duchy of Luxemburg in 1878 was 2,147,641 tons. (This is almost exactly the production of 1879, according to Herr Schlink.) The production of finished iron (*schweisseisen*) in Germany in 1878 was 1,360,420 tons. (The only rolling mill in the Grand Duchy is said to have been closed toward the end of 1878, and it does not appear to have been active in that year. There are no steel works in the Grand Duchy.) The production of Bessemer, open-hearth, and other steel (*flusseisen*) in Germany in 1878 was 570,328 tons.

The iron and steel statistics of Prussia, the most considerable part of the German Empire, from 1837 to 1879, both years inclusive, have been compiled by Dr. Wedding. The production of pig iron during the three years ending with 1879 was as follows: 1877, 1,421,667 tons; 1878, 1,568,061 tons; 1879, 1,639,676 tons.

An official report has been issued giving the statistics of the iron trade in the Grand Duchy of Luxemburg from 1874. The following is an abstract of the information contained in this report.

Years.	Number of blast furnaces.	Number in operation.	Make of pig iron.
			Tons.
1874	19	19	246,000
1875	21	21	270,377
1876	21	21	230,500
1877	20	8	215,388
1878	19	12	248,377
1879	17	12	261,256

The production of iron ore in Germany and the Grand Duchy of Luxemburg in 1878 was 5,457,101 tons. The imports of iron ore into Germany in 1878 amounted to 321,342 tons.

The *Iron and Coal Trades Review* states that "the Association of German Iron and Steel Manufacturers has recently instituted an inquiry into the results of the new customs tariff upon the wages paid in the iron trade and upon the financial position of the German iron works. Question sheets have been sent out to all the German manufacturers, of whom 305 had replied by the middle of January, 1881. The 305 works represented by these replies employed in January, 1879, a total of 134,652 hands, with monthly

wages of 8,237,049 marks; in January of the present year the number of hands had increased to 155,816, and the wages to 10,199,930 marks. The increase has therefore been 15½ per cent. in the number of hands, and 23½ per cent. in their wages. The average wages in 1879 was 61.16 marks per month; in January, 1881, it was 65.46 marks."

The production of coal of all kinds in Germany in 1878 was 50,400,425 tons. Since 1878 we have no complete report.

FRANCE.

The Ministry of Public Works have issued the statistics of the iron, steel, and coal trades of France for 1880, from which we compile the following table, in metric tons.

		1879. Tons.	1879. Total.	1880. Tons.	1880. Total.
Pig Iron.	Coke Pigs	1,329,575	1,400,286	1,637,624	1,733,102
	Charcoal Pigs	47,014		66,330	
	Mixed Pigs	23,697		29,148	
Manufactured Iron	Rails	39,980	857,071	41,944	952,308
	Merchant Bars	680,219		754,444	
	Plates	136,872		155,920	
Steel	Rails	253,742	333,265	279,847	384,626
	Merchant Steel	64,589		86,221	
	Plates	14,934		18,558	
Coal			17,110,979		19,412,112

The above figures show conclusively that the iron and steel and coal industries of France were remarkably active in 1880. From another source we learn that 306,000 tons of the steel product of 1879 were Bessemer and open-hearth steel, and that 353,000 tons of the steel product of 1880 were Bessemer and open-hearth steel. But the production of steel in France by these modern processes is still far below that of Great Britain and the United States. By the table above given it will be seen that nearly all the rails now produced in France are made of steel.

In a paper "On the Coal Industry of France in 1850 and 1880" *La Houille* gives the following figures, showing the increase in the production and consumption of coal by France during that period.

	Production—Metric tons.	Consumption—Metric tons.
1850	4,433,567	7,225,267
1860	5,950,695	14,270,252
1870	13,330,308	19,109,958
1879	17,110,979	24,866,517
1880	19,412,112	28,047,126

The following table shows, in metric tons, the sources from which France obtained her foreign supplies of coal and coke in 1880.

	Coal.	Total.	Coke.	Total.
England and Wales	3,291,655		.....	
Belgium	4,157,000		746,446	
Germany	982,332		179,010	
Other countries	1,225	8,432,212	17,989	943,445

La Houille states that in 1879 the importation of coal into France was 7,622,384 tons, and in 1878 it was only 7,012,931 tons. The importation of coke in 1879 was 760,521 tons, and in 1878 it was 738,486 tons. The year 1880 therefore presents, compared with its predecessors, a considerable increase in the importation of both coal and coke. It is claimed by French writers that with the increase in transportation facilities which are now in progress or have been proposed it will be possible for France to produce all the coal that she may need. The increase in production in 1880 over 1879 was 2,301,133 tons.

The *Journal Officiel* for May 8th contains the new customs tariff of France, from which we extract the following relating to iron and steel. (A kilogram is the equivalent of 2.2 pounds; 100 kilograms are the equivalent of 220 pounds; and 1,000 kilograms constitute a metric ton, or 2,204 pounds.)

	Francs per 100 kilograms.
Iron ore	Free.
Pig iron, refined pig called "mazee," and cast iron for ship's ballast	2
Iron in pigs or prisms, retaining at least 6 per cent. of slag	4.50
Rolled bar iron, angle iron, T-iron, rails of all forms and dimensions	6
(Crude bar iron, containing 6 per cent. of slag or more, will be admitted at the duty paid for pig iron retaining slag to the same amount.)	
Hoop iron of more than a millimetre in thickness	6
Hoop iron of a millimetre or less in thickness	7.50
Iron called "machine," serving for the manufacture of iron wire	6
Rolled or hammered sheet iron of more than a millimetre in thickness, not punched	7.50
Rolled or hammered sheet iron of more than a millimetre in thickness, punched	8
Thin sheets and black iron plate of the thickness of a millimetre or less, not punched	10
Thin sheets and black iron plate of the thickness of a millimetre or less, punched	11
Tinned iron (tinplate), coppered, galvanized, or leaded iron	13
Iron wire, whether tinned, coppered, or galvanized, or not, of a diameter of 0.5 millimetre or less	10

	Francs per 100 kilograms.
Iron wire, whether tinned, coppered, or galvanized, other sizes	6
Steel in bars, rails	6
Steel in bars or other kinds, and hoops	9
Sheet or hoop steel, hot-rolled, having a thickness of more than half a millimetre, not punched	9
Sheet or hoop steel, hot-rolled, having a thickness of more than half a millimetre, punched	9.90
Sheet or hoop steel, hot-rolled, having a thickness of half a millimetre or less, not punched	15
Sheet or hoop steel band, hot rolled, having a thickness of half a millimetre or less, punched	16.15
White sheet or hoop steel, cold-rolled, of all thicknesses, not punched	15
White sheet or hoop steel, cold-rolled, of all thicknesses, punched	16.50
Steel wire, very white, for strings for instruments	20
Filings and hammer slag	Free.
Scrap iron (debris of old ironwork)	2
Scale and forge slag	Free.

BELGIUM.

A table has been published which shows the growth of the Belgian coal industry during the fifty years of Belgian independence from 1830 to 1880. Commencing with a production of 2,568,054 Belgian tons in 1830, it steadily expanded until 1873, when a maximum production of 15,778,401 tons was reached. Since that year the highest figures recorded were in 1879, when 15,447,292 tons were raised. The production of 1880, when the figures are compiled, will, however, doubtless be found to have been larger than that of 1873. About 100,000 workmen are employed in the mining of Belgian coal.

The production of pig iron in Belgium in 1880 was the largest in her history, being 595,624 metric tons. In the same year Belgium imported 206,853 tons of pig iron, and exported 11,741 tons. Of the pig iron imported Great Britain supplied about one-half and Germany nearly all of the remainder. Belgium imports but little manufactured iron or steel. Her production of steel is likely to increase in the immediate future—no fewer than seven steel works being now in operation, in construction, or in contemplation. M. Max Goebel, of Liege, contributes to *Iron* definite information concerning four of these enterprises, as follows: "Belgium possesses at present two steel works, those of the Société John Cockerill, at Seraing, and the Société Anonyme des Aciéries d'Angleur, at Angleur. The official statistics no longer include the figures of the

production of these two works. We know, nevertheless, that the Cockerill Company alone has produced, during its last working year, 78,093 tons of steel by the Bessemer process. The Angleur Company has applied, with perfect success, the dephosphorization process. Two new steel works are being constructed, one at Thy-le-Château (Namur), the other at Athus (Luxemburg)." The production of manufactured iron in Belgium in 1880 was 489,366 tons.

Belgium is a large importer of iron ore, chiefly from Germany and the Grand Duchy of Luxemburg. She is also to a limited extent an exporter of iron ore, principally to France. Her imports in 1880 amounted to 921,784 tons, and her exports to 292,296 tons.

The prosperity of the Belgian iron trade depends mainly upon its exports. In 1880 Belgium exported 10,871 tons of nails, 4,560 tons of wire, 28,124 tons of iron rails, 32,302 tons of plates, and 162,339 tons of iron of various descriptions. In the same year the country exported 43,055 tons of steel rails, steel plates, and steel wire, and 3,522 tons of other steel—total, 46,577 tons.

AUSTRIA.

Full statistics of the production of the Austrian and Hungarian iron and steel industries in late years are wanting, but Freiherr Wilhelm von Lindheim, of Vienna, has furnished to *Iron* an elaborate statement of the production by thirty-one of the most important works in the empire in 1878, 1879, and 1880, from which we have compiled the following table of the tonnage of five leading products—the tons, we presume, being metric tons.

Articles.	1878.	1879.	1880.
Pig iron	267,035	270,146	316,067
Bar, hoop, and other iron	119,676	124,922	139,876
Iron rails	8,700	1,962	1,595
Bessemer steel rails	74,373	77,370	68,807
Black sheet iron	33,291	35,050	42,271
Total	503,075	509,450	568,616

Later information gives the following statistics of production in the whole Austrian Empire in 1879 and 1880, in metric tons.

Articles.	1879.	1880.
Pig iron	404,160	455,518
Bessemer steel	86,365	101,370
Open-hearth steel	35,222	27,638
Bessemer steel rails	85,150	76,100

These figures indicate encouraging progress in 1880, which will be more than maintained throughout the present year.

SWEDEN AND NORWAY.

The Swedish iron trade was very active in 1880. Its history for that year has been well summarized for *Iron* by Professor Richard Akerman, of Stockholm, as follows:

The greatest export of iron which Sweden has ever had occurred during 1872, but, except in pig iron, the export of the said year was not much in advance of that of 1880, which was much larger than the exports of the preceding years since 1873. The exports were:

	1872. Tons.	1879. Tons.	1880. Tons.
Iron ores	18,651	12,568	29,840
Pig iron	82,473	34,754	60,560
Blooms	13,868	10,468	8,500
Bar iron	131,833	110,308	127,500
Hoop iron, rods, and rolled wire	21,217	41,768	48,880
Plates	917	2,055	2,170
Nails	1,458	957	1,100
Steel and ingot iron	5,474	8,548	8,370

The iron import of Sweden during 1880 is not yet known, but the import of 1879 was:

	Metric tons.		Metric tons.
Pig iron	11,522	Plates	2,165
Rails	19,800	Tinned plates	1,067
Bar iron	1,513	Nails	838
Hoop iron, rods, and rolled wire	2,180	Steel and ingot iron	484

It must be observed that the imported pig iron is only used for common castings.

The production of 1880 is not yet known, but there is no doubt that it was considerably larger than 1879, when it was:

	Metric tons.
Iron ores	645,267
Pig iron	342,496
Bar and hoop iron, rods, and rolled wire	208,573
Plates	10,579
Nails	6,566
Steel and ingot iron	28,577

Yet the production of 1880 probably will not prove to have been very much larger than that of 1879, as it was anticipated a year ago. The reason is partly to be found in the declining prices, but principally in the scarcity of water which was caused by the unusually dry summer and autumn. The Bessemer

production especially has been affected by this scarcity of water, but it is nevertheless expected that the Bessemer production of 1880 will prove to have been considerably larger than that of any previous year. The production of Siemens-Martin metal also has no doubt been much increased during 1880.

It ought perhaps to be specially mentioned that Bofors Works have begun to produce cannons from Siemens-Martin steel by the Terre Noire process or without any hammering or rolling. The experiments made in the Swedish navy with a gun of that description and of very small calibre have given the most satisfactory results, and the trials will soon be continued with a larger gun of the same kind.

Professor Akerman writes as follows to the editor of the *Journal of the United States Association of Charcoal Ironworkers* concerning the iron trade of Norway:

"The common impression in America, that Norway produces a considerable amount of iron, is erroneous. The product has never been very large, and during the last twenty years has nearly ceased. The latest statistics which I have are for 1875, when but 2,235 tons of pig iron were made by four blast furnaces. During the same year only 755 tons of bar iron were made in Norway, so that one can seldom speak truly of 'Norway iron.'"

RUSSIA.

Statistics of the mining and metallurgical industries of Russia for 1878 have recently been published by M. Skalkovsky, and like statistics for 1879 have just reached this country. From these statistics we compile the following valuable information of the production of iron and steel and coal in the two years named. For 1878 the figures are in metric tons; for 1879 they are in English tons.

	1878.	1879.
Pig iron	409,633	429,865
Iron rails	1,330	6,131
" bars	179,428	206,438
" plates	74,972	69,325
Steel, blister and puddled	3,934	3,084
" crucible	4,033	4,284
" Bessemer and open-hearth	58,626	203,636
" rails	54,459	144,801
Cast-iron castings	52,244	50,974
Bituminous coal	2,013,397	2,378,138
Anthracite coal	453,415	477,972
Lignite	17,611	16,157

The above results are said to be better than those for 1877, of which we have no statistics, but compared with the figures for 1875 and 1876, which appeared in our annual report for last year, they

are very encouraging. The production of 203,636 tons of Bessemer and open-hearth steel in 1879 is a fact of much significance. It makes Russia one of the foremost of all steel-producing countries.

Finland is now a part of Russia, and its iron production is always included in that of Russia. In 1879 it produced 14,395 metric tons of charcoal pig iron in 27 furnaces, 5,016 tons of blooms from pig iron in 20 forges, and 547 tons of blooms from ore in 6 bloomaries.

The following table gives the Russian imports and exports of iron and steel and coal in 1879, in metric tons. The absence of Russia sheet iron from this table is without explanation.

Articles.	Imports.	Exports.
	Tons.	Tons.
Pig iron	103,230	11.7
Bar iron	83,196	3,291
Iron plates	30,696	380.3
Iron rails	5,610	.....
Tin plates	2,429	.....
Steel bars	17,674	246
Steel rails	152,830	.....
Coal	1,743,716	1,579
	£	£
Metal goods	4,057,566	56,092
Machinery	12,530,123	25,449

An English newspaper, *Engineering*, gives the following information concerning an extensive iron and steel establishment in the southern part of Russia, near Odessa, which has been in existence for some time and is in the hands of British capitalists, a Mr. Hughes being the manager. It says that the owners "have laid down first-class appliances for the production of merchant and engineering iron, and they are now about to engage in the manufacture and manipulation at the same place of steel in masses of unusual proportions," and adds:

This week there has been completed by Messrs. Thomas Perry & Son, of the Highfield Works, Bilston, some 155 tons of machinery, as part of a total weight of 304 tons to be employed at the establishment in question. The machinery consists of a very strong and massive horizontal engine, of about 500 indicated horse-power, and a three-high train of 32-inch rolls, having a steam lift before and behind the rolls, carrying platforms each 27 feet long. The great strength of this machinery will further appear when we indicate that the weight of the engine, including disc crank, shafts, carriages, and wheels, will be one hundred and fifteen tons; of the three-high pinions and housings, forty tons; of the fly-wheel, fifty tons; of the three-high rolls and housings, sixty-five tons; and of the bed plate, couplings, and spindles, thirty-four tons. These appliances will be used for "cogging" steel ingots, which will afterwards be rolled into rails

by a 24-inch reversing rail mill, previously supplied by the same firm of machinery engineers, who have already constructed for the iron company a large quantity of machinery in the character of forge and merchant trains, engines, saws, shears, straightening and punching machines, and the like. It was needed that the machinery which is now about to be shipped should be of the unusually powerful dimensions particularized, since some of the steel ingots to be cogged will weigh 20 cwt. apiece. The handling of such ingots in a three-high train would be cumbersome and very costly without a steam lift for the mill-men engaged in passing and repassing the ingot from roll to roll. We are unaware of any similar appliance anywhere in this country.

On the 1st of January last a new tariff on iron and steel commodities went into operation in Russia. The following analysis of its provisions we take from *Engineering*. (A Russian copeck, which is used to express the amount of the duty imposed on the various articles named, is equal to about three-fourths of a cent of American money.)

The importation of wrought and cast iron, free of duty, for use in works, will be discontinued; but agricultural implements will remain free of duty, and duplicate and spare parts of these, if imported with the machines, will also be exempt; if imported separately they will be liable to the ordinary duty. Timber vessels, including their rigging and fittings, will be free, but iron ships, with or without machinery, if imported in parts, are to pay the duty according to the class to which they belong, as ironwork. Machinery for paper and textile industries, which have hitherto been exempt, will pay according to their class. It will be noticed that the duties are very heavy, and in many cases almost prohibitive. The official tariffs are published in copecks per pood, but we have for convenience given the equivalent rates in pounds sterling per ton, a pood being taken as equal to 36.09 lbs., and a pound sterling as equal to 6.4 roubles (gold):

	Per pood.	Per ton.		
	Copecks.	£	s.	d.
Iron and steel bars, strips, angles, breadth ¼ in. to 18 in., thickness or diameter up to 7 in., blooms, and ingots	35	3	7	10¾
Ditto, breadth more than 18 in., thickness or diameter more than 7 in., plates and sheets	50	4	17	0
Iron and steel rails	45	4	7	3¼
Iron and steel scrap for remanufacture	20	1	18	9½
Tinplates, iron covered with different metals, zinc, copper	125	12	2	6
Cast-iron castings in unfinished state; for instance, tubes, columns, girders, fire-bars, plates, and railway implements	50	4	17	0
Ditto, in finished state, polished, turned, planed, etc., (painted)	100	9	13	11½
Malleable iron castings	100	9	13	11½

	Per pood. Copecks.	Per ton. £	s.	d.
Iron and steel articles in hammered state, anchors, railway implements	80	7	15	2½
Iron and steel tanks, boilers, tubes, bridges, different articles prepared from iron and steel plates and sheets	100	9	13	11½
Manufactured articles of iron coated with tin, copper, zinc	250	24	4	10¾
Ditto, gilt or artistically painted	500	48	9	9½
Wire, iron and steel coated with zinc, tin, or copper	150	14	10	11
Tools, instruments for works	80	7	15	2½
Portable and fixed engines, machinery generally	80	7	15	2½

	Per axle. Roubles.	Per axle. £	s.	d.
Coal and platform wagons	75	11	14	4½
Covered goods wagons	110	17	3	9
Third-class, luggage, and post cars	175	27	6	10½
Second-class cars	225	35	3	1½
Mixed cars (1st and 2d class)	275	42	19	4½
First-class cars	325	50	15	7½

	Per car. Roubles.	Per car. £	s.	d.
One-horse tram car	150	23	8	9
Two " "	200	31	5	0
Agricultural machinery (engines excluded)	Free from duty.			
Sea-going and river ships, steamers, and boats fully erected	Free from duty.			

Another English newspaper, the *Colliery Guardian*, adds the following explanation concerning the bounty heretofore paid to Russian manufacturers of steel rails: "It has, since 1876, been the custom for the Russian Government to pay a premium of 35 copecks per pood for every ton of steel rails made in the country, whether from native or imported materials, and this privilege was not withdrawn when the new tariff was arranged. This, however, seems to have been an oversight, and now a decree has been put forth to the effect that the full premium will be allowed only when the steel rails are made from native materials, or are converted out of worn-out rails taken from Russian railways. Where foreign material besides Russian is used, the premium will be paid in proportion to the quantity of Russian material employed. Further, it is enacted that the privileges are to be accorded to the manufactories already established, and not to any works which may hereafter be projected."

The same authority, commenting on the Russian tariff policy, says that the new tariff "is established altogether with the object of fostering native manufactures," and adds: "The idea of Russia seems to be to make itself a self-contained country as far as possible, and to compel the utilization of its resources, even though the native produce is dearer than that to be procured abroad. One of the latest developments of this policy is contained in an announcement from Odessa this week, to the effect that the Chief Administrator of the Black Sea Fleet and the Harbors has issued a circular to all the depot officials in its jurisdiction, ordering that henceforth no foreign coal is to be used for any purpose whatsoever. The orders for coal must be given to Russian mine owners, who, having the monopoly, can practically charge whatever they like."

ITALY.

An official table has been published, which gives the production and exports of iron ore from the island of Elba from 1851 to 1880. The total production of these twenty-nine years was 3,027,158 tons, of which 1,999,796 tons were raised from the Rio mines, 360,065 tons from the Vigneria, 266,761 tons from the Rio Albano, 235,557 tons from the Terra Nera, and 164,979 tons from the Calamita. Of the quantity raised, 1,488,642 tons were ordinary ore, and 1,506,082 tons were washed ore. Production and exports have been about equal every year since 1851, when the production was 22,014 tons, and the exports were 22,663 tons. In 1863 the exports first exceeded 100,000 tons, and in 1865 the production first exceeded that quantity. The production and exports during the past few years have been as follows, in tons:

Years.	Production.	Exports.
1870–71	50,802	47,765
1871–72	120,046	127,187
1872–73	201,091	173,575
1873–74	223,138	219,153
1874–75	194,324	174,617
1875–76	197,540	202,912
1876–77	196,220	182,545
1877–78	155,155	180,740
1878–79	173,177	202,966
1879–80	274,323	297,663

The export prices of Elba ore since 1851 have been as follows: When sold abroad in France, 11 francs per ton was asked in 1851–52, but fell to 6.25 francs in 1869–70, while in 1873–74 it

rose to 13.75 francs, a price which it has since nearly maintained. When sold to English consumers, 6.25 francs was paid in 1855–56, 5 francs in 1859–60, 21.75 francs in 1873–74, since which time it has gradually fallen to 8.75 francs in 1879–80. The average cost of mining the ore was 5.18 francs per ton in 1851–52, and during the last ten years it has been: 1871, 3.60 francs; 1872, 2.60 francs; 1873, 2.58 francs; 1874, 3.23 francs; 1875, 3.95 francs; 1876, 3.50 francs; 1877, 3.65 francs; 1878, 4.51 francs; 1879, 3.79 francs; 1880, 3.28 francs. The following analyses of Elba ores have been published:

	Large.	Total.	Medium.	Total.	Small.	Total.
Peroxide of iron	84.10		81.25		81.20	
Silica	11.00		4.70		11.00	
Alumina	1.50		1.25		1.75	
Lime	trace		trace		0.85	
Loss by calcination	4.00		2.25		5.00	
Sulphur	0.09	100.69	?	89.45	0.12	99.92

During the early part of the present summer a national industrial exhibition has been in progress at Milan, which has reflected much credit upon the industrial enterprise and mechanical skill of the Italian people. It is the second exhibition of the kind that has been held in Italy, the first having been held in 1861, and a comparison of the two exhibitions shows that in the development of manufactures this country has done well in the intervening twenty years. The display of iron products was principally confined to iron founding and iron mongery, in both of which lines the Italians have shown themselves to be remarkably proficient. An enthusiastic correspondent, in referring to the iron castings exhibited by the proprietors of the Mancini iron works and foundry of Bergamo, says: "The casting of this firm is equal if not superior to anything American founders showed at the last French International Exhibition. This same firm shows medallion groups, some taken from Michael Angelo's work in the Sistine Chapel of the Vatican, and nothing was ever better cast in bronze." Of other exhibits the same writer says: "The Cremona works exhibit some equally meritorious work of like character—a handsome mirror frame with many floral details, looking like anything but cast iron. The Cæsar iron works, of Milan, are equally happy, and the Pignone iron foundry, of Florence, excels in the same line. But more marked still is the cunning of the hand the Italians still possess and glory in in hammered ironwork. The most marvelous specimen shown is the exhibit

by the Officiani Francesi, of Surina, of mansion gates and rails. The design is remarkably light, chaste, yet full of strength, and the work has been hammered out in the most masterly manner. Prestini, of Milan, has a set of gates not much inferior. Everywhere one comes across the products of the hammers of Italian artistic blacksmiths; and decidedly the exhibition makes it manifest that in this branch of ironwork the Italians have no masters." Italy does not make much pig iron, owing to the scarcity of wood for charcoal and the almost total absence of mineral fuel, but she reaches forth her hand to grasp all the other branches of the iron industry, including the manufacture of rails. Her supply of pig iron is mainly derived from Great Britain, as is her supply of coal. In the manufacture of locomotives, stationary engines, railway cars, and similar articles, the Italians mainly supply their own wants.

SPAIN.

Statistics of the production of iron and steel and coal in Spain in very recent years are not at hand, but the statistics of the foreign drain upon her famous ores are accessible. Spain shows far more energy in getting rid of her native resources for the benefit of other countries, and in recording the rapidity with which she is exhausting them, than she does in utilizing them for her own benefit. Yet she is making some progress in the establishment of important national industries, some particulars of which, derived from recent English journals, and relating chiefly to new iron enterprises, may be mentioned.

Within the last few months a new establishment for the manufacture of iron, called Fabrica de San Francisco, and belonging to the Marqués de Mudela, has been at work in the neighborhood of Bilbáo. There are two blast furnaces capable of producing from 110 to 120 tons of pig for Bessemer steel between them per day. They are supplied with hot air by six Whitwell stoves, which raise the temperature to 400° C., = 750° F., and in doing so make use of the gas which escapes from the blast furnaces. The blast is effected by a beam engine. The steam-cylinder is 45 inches, and the air-cylinder 90 inches in diameter. The piston stroke is 6 feet, and the pressure 40 lbs. The engine is fed by six boilers, fitted with grates for the use of both coal and gas. The same engine operates, besides the blast machine, a powerful pump for raising the water to the hill that overlooks the works, as well as the hoisting machine for supplying the ores, the flux, and the fuel to the furnaces. It is not only intended to make pig, but every kind of manufactured iron and steel, such as plate, bars, hoops, wire, etc.

Whilst there are various mills for plates and bars, only a few blast furnaces exist, and those in Biscay, and there is no record of any rail mill or Bessemer converter being established in Spain. It is stated that a large bridge, about to be built over the Ebro at Logrono, is to be given to a Grán Fabrica Nacional, and considerable exultation is expressed that Spanish manufacturers are able to undertake such an important construction. From Ferrol the press shows great dissatisfaction that the Minister of Marine should procure from England a large quantity of Lowmoor iron, plates, and angles for naval construction, when such could be furnished by Spanish makers. At the same time it is admitted that the native product is higher in price and inferior in quality to what is obtainable from England, and much regret is expressed that Spain does not take sufficient advantage of her great natural resources. A large and important international undertaking is being offered to public competition, viz., the bridge over the Minho between Valencia and Tuy, uniting the Vigo railways with those of Portugal. The adjudication is to take place on July 30th. It is difficult to understand the apathy of English makers as regards Peninsular business, and, with rare exceptions, Belgian, German, and French manufacturers carry off the prizes, and deserve to do so. The large bridge at Porto over the Douro is finally given to M. Seyrig, representing the Société Villebroeck, of Belgium; and they mean to have the Minho work if they can get it. Railway enterprise is exceedingly active in the Peninsula; old systems are being extended and new lines projected. The Asturias, Galicia, and Leon Company have bought 25,000 tons of steel rails, and the Chemins de Fer Andalous, 5,000 tons. Krupp and Bochum obtained both contracts, equal quantities to each, 160 to 165 fr. per ton delivered. The Madrid to Cáceres and Portugal Railway will be opened in September next, and, the route from Madrid to Lisbon being then in the hands of one company, the 36 hours' journey of to-day will be reduced to one of 20 hours, and one day will be saved in the mail service between Lisbon and Madrid, Paris, and London.

It is reported that arrangements are being made for the erection of a small Bessemer plant in the neighborhood of Bilbao. A large blast furnace and small wire mill have this year been put in operation at Gijon.

There was a surprising increase in the production of iron ore in the Bilbao district in 1880. In 1878 it was 1,224,730 tons, in 1879 it fell to 1,117,836 tons, and in 1880 it rose to 2,345,598 tons. The production of 1881 is estimated at 2,600,000 tons. During the first six months of the present year the shipments aggregated 1,325,000 tons. The imports of iron ore from Bilbao by Great Britain exceed the imports by all other countries. The average price of Bilbao ore in 1879 was 9 francs; in February and March of 1880 it was 15 francs; in November and December following it was 8.50 francs; and during the first half of the present year it was 8.50 to 8.75 francs—all free on board. One of the Bilbao mining companies, the

Bilbao Iron Ore Company Limited, composed of English capitalists, shipped during 1880 no less than 539,307 tons, upon which a profit of £70,043 was realized.

ALGERIA, SOUTH AFRICA, AND AUSTRALIA.

The Mokta-el-Hadid Company state in their report for 1879 that at Bona 310,674 tons of iron ore were mined in that year—25,000 tons more than in 1878. The quantity sold was 320,000 tons—18,000 less than in 1878.

The *Port Elizabeth Telegraph*, published at the Cape of Good Hope, says that Mr. Frederic W. North, C. E., who has for some time been engaged in exploring the coal measures of South Africa, has lately thoroughly inspected all the best known and most promising coal mines of Natal, and carefully tested the coal on the Natal railroads. "Though not equal to the article imported from England, he finds it well suited for railroad purposes, and much superior to Indian coal, which he had an opportunity of using for comparison. He says, as the result of his observations, that 13½ cwt. of good English coal will do the same amount of work as 17 cwt. of Natal coal; but, estimating the cost of English coal at Durban at £3 per ton, and the cost of Natal coal at the mines at 12s. 6d. per ton, a very great saving will be effected by using the latter. The principal mines are at Dundee, New Castle, and Sunday River. A capital mine could bé opened within fifteen miles of Ladysmith." Commenting upon this information an English writer says: "The possibility of using cheap local fuel, instead of costly English coal, in these distant colonies, must give a great impetus to railway construction, and in Natal will provide a better and more expeditious highway to the Transvaal and Orange Free State. The railway bill for the expenditure of £5,000,000 upon railway construction in the Cape Colony, which has just received the sanction of the Assembly at Capetown, is intended by one of the main lines to open up the coal fields of that colony. Therefore, after considerable delay, these coal deposits are now about to be placed in direct communication with both the coast and the diamond fields."

The *Iron Trade Exchange* says that there are but two places in Australia where the native ores have been successfully reduced in the blast furnace. The blast furnace and rolling mill at Lithgow, in New South Wales, were erected by a private company of Australian capitalists, known as the Esk Bank Iron Company, and were described in our last annual report. The *Exchange* says that

Thomas Perry & Sons, of Bilston, have recently sent out a sheet mill to Sydney to the order of this firm, and the company contemplate the manufacture of corrugated sheets, for which there is so much demand in Australia. This is the most important iron-making concern in Australia; its mill has turned out a heavy section (75 lbs.) of tram rails and other work for the New South Wales Government. It has a standing contract to reroll the old iron rails for the government railways. The Lithgow iron is smelted with coke and raw coal. The other furnace referred to in the *Exchange* is situated in the colony of Victoria, and is the property of some Ballarat capitalists, who trade under the style of the Lal Lal Iron Company. Lal Lal is the name of a small railway station about 12 miles on the Melbourne side of Ballarat, and the furnace is about 3 miles away. A furnace which was at work here for several years was blown out in the early part of last year, and a new furnace, to use charcoal, has been constructed on the pattern of the improved charcoal furnaces in Sweden. The iron ore at Lal Lal contains from 45 to 60 per cent. of metallic iron. The new furnace was successfully blown in on the 26th of March last, under the management of Mr. Buderick, a Swede. It is intended to run a large part of the product of the furnace directly into castings.

It is stated that 112 miles of railway were opened in South Australia in 1880, and that 306½ miles are now in course of construction. At the end of 1880 there were 682 miles available for traffic, including 18 miles of private lines.

The production of coal in New South Wales in 1878, the latest year for which we have received statistics, was 1,575,497 tons. We repeat this information from our last annual report.

THE DOMINION OF CANADA.

A strong memorial has been presented to the Hon. Sir S. L. Tilley, Minister of Finance of Canada, urging the adoption of measures by the Canadian Government that will facilitate the development of the iron resources of Canada. From this memorial we take the following statistics of the imports into Canada of iron and steel and manufactures thereof from 1870 to 1880:

1870-71	$10,311,188	1876-77	9,330,982
1871-72	12,291,908	1877-78	8,298,517
1872-73	20,202,753	1878-79	8,519,321
1873-74	18,878,411	1879-80	10,217,228
1874-75	15,783,960		
1875-76	11,600,897	Total in 10 years	$125,435,165

This very large ten years' importation was made up as follows:

Iron	$33,704,154
Steel	5,408,121
Iron and steel rails, plates, etc., for railways	31,357,532
Machinery, hardware, and iron manufactures generally	54,965,358
Total	$125,435,165

The memorial comments upon these figures as follows: "It will be seen that for the last ten years the imports of iron, steel, and railway iron and steel averaged seven million dollars per annum, and of machinery, general hardware, and other iron manufactures, five and a half millions more; or a total average of twelve and a half millions. The question may be considered, whether the greater part of this seventy millions' worth might not have been produced at home, instead of being imported from abroad, all this vast amount of money going out of the country to pay for it. But what a gain to the Dominion it would have been had we produced at home only the half of this consumption of seventy millions' worth."

We hope that Canada may yet make her own iron and steel, for the production of which her resources are ample. In the manufacture of charcoal pig iron especially we can not see why there should be any hesitation whatever. With the proper effort she should make as good charcoal iron as is made in the United States, and plenty of it. It is surely a reproach to Canadian enterprise that Canadian ores should be exported to this country while Canada is importing our iron. This is the Spanish policy. During the past year arrangements have been made by several Bessemer steel establishments in the United States to secure a supply of ore from Canada that is practically free from phosphorus.

The province of Manitoba, which lies just north of Minnesota, has recently attracted some attention as a possible depository of large quantities of mineral fuel. Coal of good quality has been found within its borders, and some arrangements have been made to mine it and bring it to Winnipeg and other markets. A vein of coal resembling anthracite has also recently been discovered in Burrard Inlet, British Columbia.

The recent erection and successful blowing in of a small blast furnace at Irondale, near Port Townsend, in Washington Territory, have inspired the people of British Columbia with the hope that iron works may be established in their province. The *Victoria Standard* gives expression to this hope as follows:

The success of this enterprise on Puget Sound should act as an incentive to our own capitalists to embark in a similar undertaking in the province, where it could be prosecuted under more advantageous circumstances. At the Irondale works the limestone rock has to be imported, and, owing to the absence of coal, the smelting has to be done with charcoal. These are drawbacks which add greatly to the cost of iron produced. On Texada Island limestone is abundant, and coal is obtainable in unlimited quantities in the immediate vicinity. These advantages would enable smelting to be there carried on under the most favorable circumstances possible. It has been stated that the company owning the Irondale works intended putting up a branch furnace on Texada Island, in order to supply the trade in this province as soon as the prospect of sufficient demand for iron to warrant the necessary expenditure of capital shall arise. It would be a reproach to the capitalists of this province to allow a foreign company to come in and manufacture our own iron and reap the profit of the undertaking. The opportunity now offered should be embraced by local capitalists. The extent of the expenditure required has been demonstrated by the cost of the Irondale works. A furnace erected on Texada Island certainly need not be more costly than that of Irondale, and could probably be put up at less expense. A comparatively small outlay by local capitalists now would enable them to reap the profit that will otherwise be acquired by the enterprising firm who have erected the furnace at Irondale.

All the requisites for the manufacture of pig iron being found in British Columbia and elsewhere on the Pacific coast, it would seem that the local demand would alone furnish a sufficient incentive to the erection of many blast furnaces of even greater capacity than that at Irondale. A charcoal furnace has for many years been in operation at Oswego, in Oregon, and one has this year been blown in at Clipper Gap, in California.

SOUTH AMERICA.

A somewhat ambitious iron enterprise in the State of Bayaica, in the United States of Colombia, was projected a few years ago, and in 1880 the erection of the necessary buildings and machinery was undertaken. The enterprise is under the care of the State Government, but its success is nevertheless regarded as problematical, owing partly to the low condition of the government treasury, and partly to the indifference of the people to the establishment of iron works or any other manufactures. The scheme embraces a blast furnace and a rolling mill at Samaca, about 65 miles east of Bogota. Six skilled workmen were engaged at Pittsburgh, Pennsylvania, in July, 1880, and taken to Samaca to assist in the erection of the works and in putting them in operation, but in a short time

four of these returned, and on the 31st of December one of the two remaining workmen, Martin Richards, wrote as follows concerning the prospects for the completion of the works:

The iron works in course of construction at this place are going along very slowly, and at the present time it is very doubtful if ever they will amount to much. The revenue of this State is very small. The treasury is empty, and if money enough is raised to complete the works it will be with great difficulty. I think that it will be six months at least before the blast furnace is ready. After it is ready they have to make all the heavy castings, such as fly-wheels, rolls, housings, bed plates, etc., and a large amount of smaller castings before they can do anything in their rolling mill. They expect to make about ten tons per day from the blast furnace when finished. There is an old blast furnace here from which they have made some iron, but not since I have been here, but the iron produced was very hard and brittle. As you know, four of our company returned three months ago, and it is very uncertain if Thomas Hickey and myself will remain very much longer here or not. We can not tell at the present time, but it looks as if we might start on our homeward journey at any time. If the works are completed I am afraid that the State will be too poor to carry them on, because the State will consume the iron in building railroads, etc.; therefore there will be no returns for years to come; but if the few who are interested should be able to carry it on, it will be a blessing for the country. I said the few who are interested, because the majority in this country seem to think that there is a great waste of money in these works, and several articles have appeared in the newspapers here to that effect.

We are without later information from Samaca than is contained in the above letter.

The rich but scantily developed iron resources of Brazil are referred to in some detail in a report by H. Gorceix, Director of the Mining School at Ouro Preto, of which we give an abstract.

He refers to the state of the manufacture of iron in Brazil, still carried on at the government works, near Ypanema, S. Paulo, and in a number of small foundries in Minas Geraes and Western S. Paulo. Iron, he states, costs at Ouro Preto and its neighborhood £17 10s. to £21 a ton; at Conceição, £28; and further back, £49 to £56; whilst in Europe its regular price is £5 to £5 12s. Such figures speak for themselves, yet the deposits of iron ore in Minas Geraes are incontestably among the richest and most abundant in the world. In the report Mr. Gorceix refers to the beds of iron ore, yielding 65 to 70 per cent. of iron, near the coal mines of S. Jeronimo, in Rio Grande do Sul, to the rich ore at the Candiota coal mines in the same province, and to the magnificent ore at Cachoeira, also in Rio Grande, having the extraordinary richness of 85 to 90 per cent., and having near it coal of a quality sufficiently good for iron manufacture.

American Iron and Steel Association

Statistics of the American and foreign iron trades, in 1880.